RAILROAD GAZETTE.

FRIDAY, JUNE 18.

The Foundations of the Hawkesbury River Bridge.

We illustrated and discussed in our issue of April 30 the various competitive plans for the Hawkesbury River bridge, in which it will be remembered that the three American competitors were noticeably the lowest, and the highest bidder of the three, the Union Bridge Company, of New York, carried off the prize, its plan being preferred. In discussing the letting we pointed out at the time that the success of the American competitor was probably due quite as much to the superiority of the foundations which it proposed furnishing as to the design of the superstructure. The detail drawings which we present this week go far to show how this was possible, by indicating that the very superior foundations which the Union Bridge Company has contracted for are consistent with great economy in construction.

To make clear the superior character of these foundations we repeat from the issue referred to the comparative statement there given of the amount of the bids and the foundations proposed to be furnished for the money:

No.	Amount.	Comp. cost: accepted bid = 100.	Total foundation	Dist. bet. centres. Ft.	Dist. bet. centres. Fr.	Total square feet bearing surface.
The three American bids..... 1.	$1,364,690	85 9				
2.	1,440,260	90.6	20 cylinders,	20	40	6,283
3.	1,589,220	100.0	6 cassions, 24 × 52	..	..	6,746
Average....	$1,464,720	92.17				6,514
The three best English bids.... 4.	$1,834,645	115.4	20 cylinders,	10½	28	1,732
5.	1,960,365	123.4	24 "	16	28	4,825
6.	2,114,100	133.0	22 "	15	28	3,887
Average....	$1,969,700	123.93				3,481
The three next best English.... 7.	$2,137,660	134.5	30 "	18	40	7,634
8.	2,210,160	139.5	22 "	15	28	3,888
9.	2,264,920	142.5	8 caissons, 22 × 54	..	..	9,504
Average...	$2,206,250	138.83				7,009
The three next best English.... 10.	$2,362,450	148.7	36 cylinders,	12	25	4,072
11.	2,818,800	177.4	7 ellip. cals.,	70×33	..	12,699
12.	2,842,600	178.9	8 circ. "	40	..	10,053
Average....	$2,674,620	168.33				8,941
Average of the nine English..	$2,283,520	143.70				6,477
The French bid..... 13.	$3,329,100	209.5	5 " "	57½	..	12,983
The Australian bid .... 14.	3,413,590	214.8	20 cylinders,	14	48	3,078

On the rude, but as a rule tolerably fair presumption that half the proposed bid was for piers and foundations and the remainder for superstructure, we found that these bids gave the following comparative cost per square foot of pier:

—American.— Edgemoor.	Union.	—English.— Three lowest.	Three next lowest.	Three highest.	French.	Australian.
$114.50	$118	$283	$157.50	$140.50	$128.50	$554

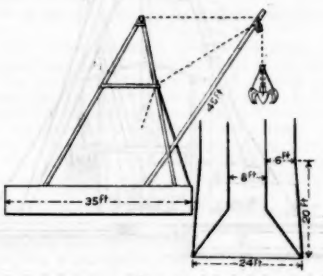


Fig 5.

Section of Scow and Derrick Plant, Hawkesbury River Bridge.

As a matter of fact, the total estimated cost of the piers and foundations illustrated in this issue approaches tolerably close to half the total contract price, when everything is considered, although it does not quite reach it. Relatively there can be no great injustice in that basis of comparison.

The Hawkesbury River bridge foundations, when completed, will enjoy the distinction of being by far the deepest in the world, although their difficulty is by no means in proportion, the total height from top to bottom of pier being some 210 ft. at the deepest pier, about 190 ft. on four others, and nearly 150 ft. on the remaining one, the exact height being, of course, still an uncertain question. Of this the upper 42 ft. 8 in. is masonry, of the very neat plan shown in figs. 1 to 3, will be put together near the site of the bridge, launched, towed to the site and sunk to the bottom by the concrete filling. As the sinking proceeds the caisson and concrete filling is continued up. The mixing will be done by machinery placed upon a float anchored alongside of the pier, not shown in the engraving. The mixer consists of a square box 16 ft. long, provided at each end with an outer ring or collar, which rests upon rollers. A toothed wheel at the outer end meshes with a pinion driven by an engine. The revolution of this box thoroughly mixes the sand and cement, which are introduced through a curved chute leading from a hopper on a platform just above the box. The requisite quantity of water is admitted at the same time. The mixed cement either falls from the outer end into the buckets, which are carried by cranes where needed on the pier and dumped, or will be run by chutes directly into place. The broken stone will be obtained by contract from a plant already in operation, and the cement and boiler plates will be delivered directly at the site from ships, deep water extending to and above the bridge, which is another great advantage. Portland cement will be used, the mixture being 1 cement, 2 sand, 3 gravel and 4 broken stone.

Upon the opposite side of the pier is moored a large float carrying two sets of hoisting machinery, shown in outline in figs. 5 and 6, and of the same general nature as that shown more fully in figs. 7 to 11, which was used on the Atchafalaya bridge. The booms will be seen in fig. 6 to be so arranged that either dredge can be worked in the centre or one of the end dredging-tubes. Thus, by making one dredge take two loads from its own end tube and one from the middle tube, the amount of material excavated from each of the three tubes can be equalized. The material is simply dumped over-board,

Fig. 2.

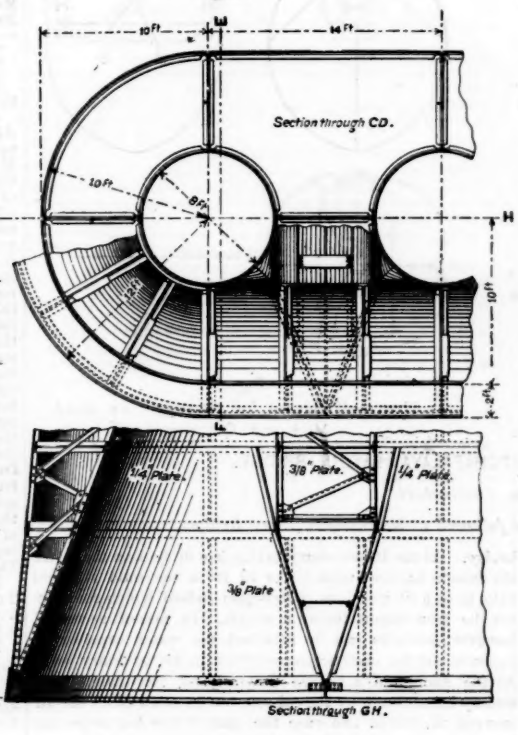


Fig. 3.

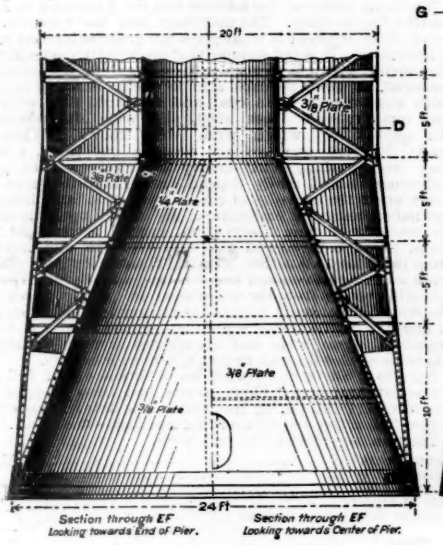


Fig. 1.

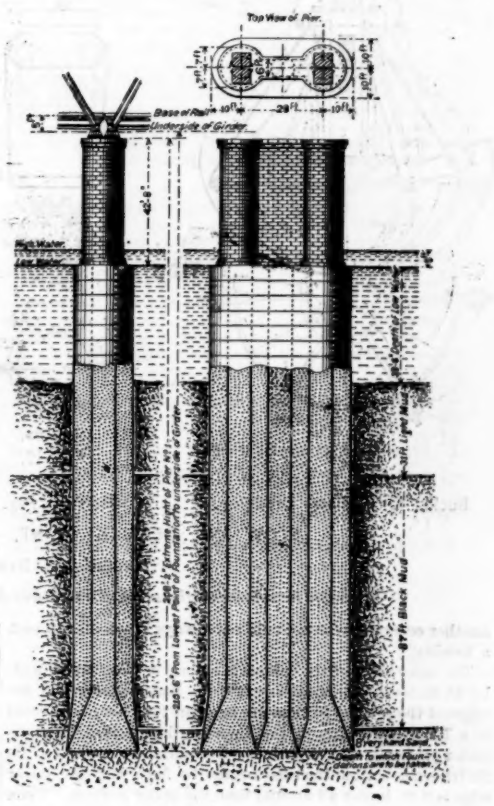


Fig. 4.

FOUNDATION PLAN FOR HAWKESBURY RIVER BRIDGE, AUSTRALIA.

ANDERSON & BARR, *Contractors, under* UNION BRIDGE COMPANY.

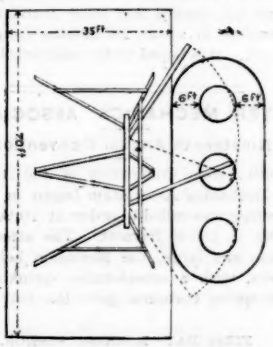


Fig. 6.

Plan of Scow and Derrick Plant, Hawkesbury River Bridge.

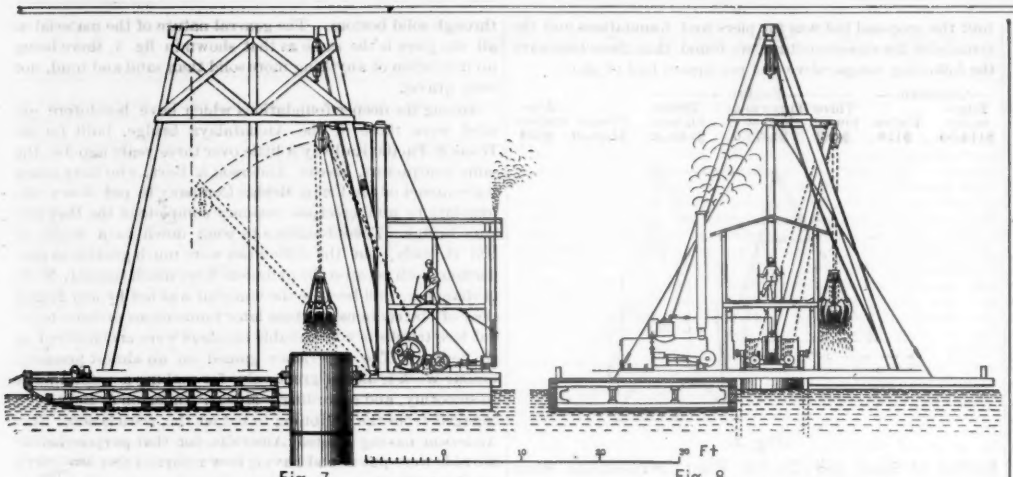


Fig. 7. Fig 8.

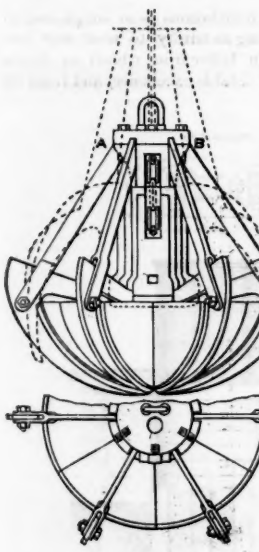


Fig. 9

Bucket for Ordinary Dredging.

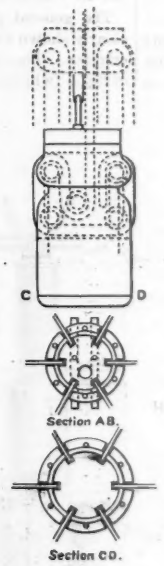


Fig. 10.

Hoisting Rig.

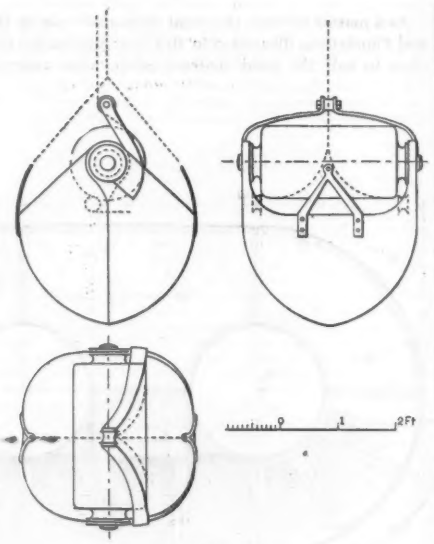


Fig. 11.

Clam.shell Bucket for Hoisting Fine Sand, Mud and Quick-sand.

SCOW AND DERRICK PLANT, ATCHAFALAYA BAYOU BRIDGE.

ANDERSON & BARR, *Contractors*

(Being in substance the same plan as will be followed at Hawkesbury River Bridge).

another economy which would not always be possible in such a locality.

The outer sheet of the caisson is oblong in plan, 20 ft. wide by 48 ft. long. It is made of ⅝ in. boiler plate, and the edges of the several sections are brought together and riveted to a T-bar placed upon the interior, thus making the exterior perfectly smooth and free from offsets. At a point 20 ft. from the bottom the tube begins to flare, and the lower edge is 2 ft. larger all around than the upper portion. Upon the outside of the bottom is secured a steel plate or cutting shoe, 1 in. thick, 2 ft. deep and projecting 6 in. below the edge of the tube; the lower edge of the shoe is sharpened. Within the outer tube are placed, at equal distances apart, three cylinders or dredging tubes, 8 ft. in diameter, made of ¼-in. iron, and united in the same manner as the outer one. The lower part of these tubes is extended to meet the cutting edge, and the inner and outer tubes are rigidly united by a system of bracing, as shown in fig. 1 to 3, which also represent the bucket to be used. After the cylinder has reached a solid resting place, the inner dredging tubes, as well as the surrounding sheet, will be filled with cement, thus making a pier of solid cement from the bottom to the water level, as shown in fig. 4. From low water up the piers will be of cut stone masonry.

Thus it will be seen that the boiler iron shell is of importance only for constructive purposes, and it will matter little if after the pier is sunk it eventually rusts away, as it no doubt may in time.

The form of bucket which will probably be chiefly used is that shown in figs. 9 and 10, but of a larger size, holding 1½ instead of only ¾ cubic yards, as at Atchafalaya. While similar in principle to many other such devices, this bucket is one specially designed by Messrs. Anderson & Barr as offering the greatest advantages for such work. The opening and shutting rig will be seen to be very simple and somewhat peculiar. Two hoisting ropes are attached to it. When hoisting or lowering by one the flukes of the bucket stand open in the position shown by the dotted lines of fig. 9. When the other rope is hoisted on, the flukes are first drawn together with great force and then by continuous motion the bucket is hoisted, heaping full if the material is at all favorable.

A defect of this bucket is that if the material is soft mud or otherwise very fluid much of it will escape. In such material the clam-shell bucket, shown in fig 11, is employed, which hardly permits anything to escape. This was used a good deal at Atchafalaya, and will probably be used a good deal at the Hawkesbury bridge.

Any ordinary obstruction which may be encountered was cut through or shoved to one side, even at the Atchafalaya bridge. At the Hawkesbury bridge it will be seen that after the caisson has been sunk 30 or 40 ft. in the mud it would have to be a very serious obstruction indeed which could resist the tremendous insistant weight. In case of necessity, however, air-locks can be attached, the water expelled by pressure and the obstruction removed in the ordinary way. At the Atchafalaya bridge the frequent tree-trunks were usually cut through by the caisson, but in other cases the air was put on, and in one case the part of the log projecting into the tube was grappled and the log broken, when the pier was sunk without further trouble.

It will be seen, therefore, that despite the tremendous depth, which is quite unprecedented, the process of sinking the foundations does not promise nearly so much difficulty as a great many others. The bottom is not one subject to much scour, and it is quite possible the piers will not be carried down nearly so deep as has been proposed from the borings only. Had the bottom been such as to make it impossible to sink the piers by dredging, say because of numerous large bowlders or for other reasons, it would probably have been indispensable to stop the foundations at a much higher level, since as we pass 100 ft. below the water-level we rapidly approach the limit of human endurance of air pressure.

The contract will require that these foundations should be executed complete in about 18 months from the time of beginning work. It is hoped to do considerably better than that.

MASTER MECHANICS' ASSOCIATION.

Nineteenth Annual Convention.

The Nineteenth Annual Convention of the American Railway Master Mechanics' Association began in Boston, June 15. The meeting was called to order at 10.20 a. m. by the President, Mr. J. Davis Barnett. The attendance at the opening session was large, the Meionaon being well filled with members, with a considerable sprinkling of ladies, whose bright spring costumes gave the hall an attractive appearance.

FIRST DAY—MORNING SESSION.

Prayer was offered by the Rev. Mr. PERRIN, who offered up an eloquent invocation, having a special application to the occasion.

Mayor O'BRIEN, of Boston, then made an address of welcome, offering the hospitalities of the city to the members of the Association. He referred to the importance of the Association and its objects, and to its wide-spread membership and to the share which the members had had, by their brains and experience, in utilizing the Boston capital invested in railroads. He dwelt at length on the local aspects of the convention, and expressed the hope that some of the conservative people of the city would listen to the proceedings of the convention, and learn something of the progress that has been made and the improvements effected during the past few years. He closed with a reference to the ladies, which was duly appreciated.

The Secretary then called the roll, when the following members answered to their names:

Bushnell, R. W.	Montgomery, Wm.
Barnett, J. D.	Milan, Thomas
Black, John	Mills, C. W.
Blackwell, Charles	Noble, L. C.
Blackall, R. C.	Paxson, L. B.
Briggs, R. H.	Prescott, G. H.
Beam, John	Player, John
Campbell, E. A.	Pillsbury, Amos
Chapman, N. E.	Richards, George
Coolidge, George A.	Roberts, E. M.
Cook, John S.	Robertson, H. J.
Cooke, Allen	Stone, W. A.
Collier, M. L.	Schlacks, Henry
Ennis, W. C.	Smith, W. T.
Finlay, L.	Shaver, D. O.
Fowle, I. W.	Smith, Wm.
Ferguson, G. A.	Setchel, J. H.
Fenwick, A.	Sprague, H. N.
Griggs, Albert	Stevens, G. W.
Gordon, H. D.	Selby, W. H.
Gilmore, W. L.	Stewart, Wm. A.
Hinman, M. L.	Tandy, T.
Harding, B. R.	Twombley, F. M.
Haggett, J. C.	Twombley, T. B.
Hackney, George	Turreff, W. F.
Hackney, C.	Taylor, J. K.
Howison, N. W.	Thumser, John
Johann, Jacob	Wakefield, S. W.
Lauder, J. N.	Wiggins, J. E.
Leech, H. L.	Woodcock, W.
Lannon, Wm.	Whitney, H. A.
Lockwood, W. E.	Forney, M. N.*
Meehan, James	Miles, F. B.*
Morse, G. F.	Sinclair, Angus*
McGlenn, J.	Sidgley, James†
McCrum, J. S.	

* Associate Members.
† Honorary Member.

The Secretary said that 77 members were present or known to be in the city.

President BARNETT then delivered his annual address. After referring to the convention held in Boston 14 years ago, and replying gracefully to the welcoming words of the Mayor, he said that the Association was in a flourishing condition. The change of gauge in the South had delayed some of the members from that section.

The main theme of the address was the Uncertain in Locomotive Engineering. The uncertain and the experimental work of the engineer is what gives the greatest interest to the conventions. It is not strange that apparently contradictory statements are made, when we consider the differences in material, in fuel, perhaps also in men. Striking illustrations were drawn from coal and the wide differences in the quality, and from steel, the wide differences in the quality of which were well known. When so many different qualities are seen in one thing, a word may be anything but strictly descriptive. The great differences noted really depend on slight differences, and hence arises the necessity of close observation and frequent mutual exchanges of experience. He urged upon members the necessity of close observation, careful record and precision in expression, and also extreme care and freedom from prejudice. Another striking illustration was drawn from steel and its conduct under rolling and sliding friction, and still another from the use of steel fo boiler plates, and the wide differences in results due to even slight differences of quality. In fact, steel sometimes seemed almost a living organization, so wide and unexpected were its variations. The address closed by an urgent appeal to members.

Secretary SETCHEL reported an addition of 22 full and 2 associate members. Three names had been dropped and five members died during the year. The total membership is now 245 active and 19 associate members—264 in all.

The total receipts for the year were:

Assessments	$1,256
Initiation fees	22
Printing fund	585
Sale of reports	65
Balance from previous year	308
Total	$2,236

This amount was turned over to the Treasurer. The usual contributions to the printing fund were received. The cost of printing the annual report was, for printing, $450; engraving, $327. Of 1,200 reports printed 711 were sent to railroad companies, 264 to members and 225 remain on hand.

The Boston fund now includes $5,294 invested in government bonds and $307 interest uninvested. This interest will be invested at the next meeting of the trustees.

The report was accepted.

The Treasurer's report was then read, showing disbursements as follows:

Total cash as per Secretary's report	$2,236
Printing reports, Secretary's salary, etc	1,792
Balance on hand	$444

This report was accepted.

A recess of ten minutes was then taken to permit new members to sign the constitution.

Mr. LOCKWOOD offered a motion that the minutes of the previous convention, as printed in the annual report, be amended.

This led to a discussion of some length and a little sharpness on the correctness of the annual reports as published, and to the method of reporting the discussion. This discussion was finally ended by a motion to lay the whole subject on the table.

The hour of noon having arrived the meeting was opened under the rules for short discussions of questions submitted. These were as follows:

1. Mr. STEVENS: What good are Self-Dumping Ashpans?

Mr. STEVENS opened the discussion by submitting several letters referring to great saving of coal effected by such ashpans. He could not see how economy of fuel was effected.

Mr. COLLIER had tried an ashpan under a 10-wheeler and found it a good ashpan, but had seen no appreciable advantage.

Mr. JOHANN could see no reason for saving fuel by use of a self-dumping ashpan. It would be of use in winter.

Mr. GRIGGS had had no trouble in snow or winter running. He moved to dump the ashpan and go higher.

Mr. STEVENS, in this connection, offered a resolution deprecating the custom of giving letters of recommendation to patent or other devices for publication. Carried.

2. Mr. SINCLAIR: Is the present form of quadrant satisfactory as a means of regulating cut-off?

Mr. SINCLAIR said his attention had been called to this subject by the difficulty of regulating the cut-off satisfactorly while convenient as a matter of use, that was all. He had seen on a long trip many ties burning, and thought that this resulted from dumping hot coals from the ashpans.

Mr. CODDINGTON said that an advantage claimed was that the dumping of the fire could be avoided, and ashes dumped where wanted.

Mr. WHITNEY had used these ashpans, and had found no saving in coal. The advantage was in putting ashes where wanted. Another advantage was in preventing snow from being forced into pan in winter, and in keeping the pan clear at such times.

Mr. MCCRUM thought that they would be very unsafe on a prairie road, though possibly desirable in making experiments with the indicator. It was difficult to regulate the cut-off closely with a notched quadrant. He referred to the use of screw and steam reverse gear, but thought that some cheaper arrangement could be found.

3. Mr. SETCHEL: What is the advantage of substituting a Rectangular Exhaust-Nozzle for a Round one?

Mr. SETCHEL said that the Pennsylvania road, he understood, had adopted a square form for exhaust-nozzles.

Mr. BRIGGS referred to the action of the exhaust in producing a vacuum.

Mr. JOHANN could not see the advantage of a change of form. He thought it was a matter of convenience chiefly.

Mr. FORNEY said the question reminded him of a discussion on oils where one oil, it was claimed, would lubricate because the ultimate particles were round, while another would not because the particles were square. He thought that the nozzle question could not be decided until the form of the current in the stack was decided.

Mr. SINCLAIR compared the action of the exhaust nozzle with that of an injector. A round nozzle corresponding to the size and shape of the stack had been proved best.

Mr. SPRAGUE thought that a round current would best fill a round stack.

Mr. ROBERTS said that it was inconvenient to clean out a straight stack. For this a round nozzle was best.

Mr. HOUSTON had used square, oval and round nozzles, and most of the square nozzles could be found in his scrap heap.

Mr. FORNEY was open to evidence. He had seen the square nozzles used on the Baltimore & Ohio. He had heard that the Pennsylvania had adopted the square nozzle as a matter of convenience.

Mr. AMES had used both square and round, and had found no difference in results.

Mr. SETCHEL said the Pennsylvania had used square nozzles, he had been told. Was that in former years, when each man had his own engine, a square nozzle was put in so that the engineers could not measure the hole and want the size changed?

4. Mr. JOHANN: Are single or double exhaust nozzles the best?

Mr. BRIGGS said that Mr. Martin's experience, reported to the Association several years ago, had had much reference to this point.

Mr. SINCLAIR said that Mr. Martin favored the single nozzle.

Mr. WOODCOCK said that Mr. Martin obtained the best results from what he called a compound nozzle.

Mr. BLACKWELL thought that fault found with the single nozzle was due chiefly to faults in size or proportion of the nozzle. In one case he had removed heavy back-pressure by making the openings from each cylinder about the same size as the tip of the nozzle. The nozzle (on a Consolidation engine) was 4¾ in. diameter.

5. Mr. CAMPBELL: Best Position for Check-Valves.

Mr. CAMPBELL said he heard that on the Pennsylvania Railroad they had adopted a check placed inside the boiler.

Mr. AMES said that this was a new experiment and had not been fully tried.

Mr. FORNEY said that the check referred to was intended to prevent escape of steam from the boiler in case the valve was knocked off by accident. He referred at some length to the injury caused by escape of steam in case of collisions, etc., and to the advantages to be obtained by reducing the number of openings in the boiler.

Mr. BLACKWELL referred to the method used by Mr. Webb on the London & Northwestern, of introducing the feed-water at the back end of the boiler.

The discussion of short topics was then closed.

The SECRETARY stated that the names of Messrs. H. W. Eddy and H. D. Garrett had been accidentally omitted from the roll.

The question of amendments to last year's minutes was then taken up again.

The SECRETARY spoke at some length in defense of the report, making several excellent points in its favor. The Secretary's statement was heartily applauded.

Mr. LOCKWOOD spoke at some length, with much sound but little substance.

The question was closed by the adoption of a motion that the printed minutes be accepted, an amendment to correct them as desired, by Mr. Lockwood, being unanimously voted down.

The next order of business was the report of the Committee on Boiler Construction, which was read by the Secretary.

REPORT OF THE COMMITTEE ON BOILERS.

The Committee in its report refers to papers received by it from Mr. Barnett and Mr. J. Snowden Bell. Mr. Stevens reports the construction of several new locomotives with boilers adapted to an unusually high pressure, and several other valuable papers were submitted.

This report was full and elaborate, and was accompanied by many letters, blue-prints, etc.

The report refers especially to the frequency with which old devices come up as alleged novelties.

Mr. S. SNOWDEN BELL then read his paper, which was referred to in the Committee's report, and which was an excessively long historical account of the development of the locomotive boiler to its present form, the greater part of it, as is, indeed, necessarily the case in a paper of this kind, being merely a recapitulation of what as been written before.

After the conclusion of Mr. Bell's paper, the Association, at 2 p.m., adjourned until 9 a.m. on the following morning.

Messrs. Charles Blackwell, C. K. Domville, John Headden and D. A. Wrightman arrived during the first day's session.

The five members who died during the past year were George Boyden, Y. H. Dotterer, John Ivenson, J. C. McCune and W. M. Pendleton.

The correct number of members on the roll is: 10 honorary, 245 active and 14 associate; 269 in all. Over one-third are present.

After the adjournment, the members were taken driving in carriages, visiting the Back Bay district, Commonwealth avenue and other places of interest about the city.

SECOND DAY.

The convention was called to order by President Barnett at 9:30 a. m.

By consent, Mr. LAUDER offered a resolution to drop the name of W. E. Lockwood from the roll, on the ground that he was not properly qualified for membership. Carried unanimously.

The regular order of business, the report of the Committee on Improvements in Boiler Construction, was taken up. Mr. Bell finished the reading of his paper on the history of the locomotive boiler.

The President then appointed committees as follows:

To Audit Accounts, Messrs. G. W. Stevens, H. Tandy and N. W. Howison.

On Assessments, Messrs. R. H. Briggs, J. T. Gordon and W. Fuller.

On Nomination of Officers and Place of Next Meeting, Messrs. M. L. Collier, H. A. Whitney and Charles Blackwell.

On motion of Mr. LAUDER it was resolved that the Convention should not sit on Thursday, that being a legal holiday in Boston.

The report of the Committee on Boilers was then opened for discussion.

Mr. LAUDER called attention to the frequency of leaks around the mud-ring, and thought that part of the boiler was neglected. He had begun the practice of making the mud-ring deeper and putting in two rows of rivets. If this were expedient in New England with good water it would be much more needed where water was bad. If two rows of rivets were not enough, then put in three, four, or ten, if necessary.

Mr. CAMPBELL had been troubled with leaks around the fire-box. The only difficulty he saw was in riveting at the corners.

Mr. LAUDER tapped in a false rivet at the corner for the second row of rivets, the same as for the first.

Mr. SETCHEL said that the Lake Shore road had recently put on several heavy passenger engines with boilers intended to carry 180 lbs. pressure.

Mr. STEVENS said that those engines were used on very heavy passenger trains, and did their work well, but they had not yet been in service long enough to report fully on their performance.

The discussion was then closed.

The Secretary then read the report of the Committee on Standard Driving Wheel Centres and Standard Sections for Tires. In recommending a standard diameter for wheel-centres the Committee desired to ascertain and conform to general practice. A uniform diameter is desirable, in order that manufacturers may be able to make tires of the standard size, and railroads be relieved from the necessity of carrying many tires in stock.

The Committee recommends the following standard sizes: 38, 44, 50, 56, 62 and 66 in. Also that the Association contract with some reputable firm for standard gauges. For shrinkage in putting on tires the Committee recommend an allowance of 0.01 in. to 1 ft.

The Committee also submitted a standard section of tire, the general dimensions of which are as follows: 5½ in. width of face; the flange to project 1⅛ in. from face of tread; tread cylindrical except for 1½ from face, where it is tapered ¼ in. (in the 1½ in.); radius of throat of flange ⅝ in.; thickness of tire, 3 in.

The report was accepted and opened for discussion.

Mr. FORNEY referred to the discussions had in the Car-Builders' Association and thought it would be very desirable to reach some agreement as to the form of flange, so that there might be an agreement and a similarity of form in locomotives and cars. He preferred a greater radius of throat than the committee had recommended.

Mr. LAUDER preferred a ⅝ in. radius of throat. The ⅝ in. radius had been adopted for cars on account of the difficulty in getting a small radius on a chilled wheel. He thought that an agreement on form of flange would be a good thing. It was to be remembered, however, that a locomotive flange altered rapidly in form after turning. He was in favor of deliberation and discussion before finally adopting a standard form.

As to standard sizes for centres, the Committee had received reports from roads using over 8,000 locomotives, and the sizes recommended conformed most nearly to those in general use. He dwelt on the advantages to makers and railroads alike of using standard sizes. To realize these fully the use of standard gauges would be necessary, and these could only be supplied by agreement with the Association.

Mr. JOHANN thought that while there might be much difference of opinion as to form of wheel-tread, an agreement could be readily reached as to uniform diameters of centres. He had had much experience in bringing wheels to a uniform diameter on several roads. In one case, with 65 engines, he had reduced the number of tires carried in stock from 40 to 6. On the Wabash road also, he had, after several years' work, brought all the centres down to four sizes.

Mr. FORNEY moved that action on the standard form of flange be postponed. Carried.

Mr. CHAPMAN said that a committee had made a report on this question several years ago, but no practical action had followed. While the size of centre was important, the form of tread was also very important to the manufacturers.

Mr. SPRAGUE asked whether the bevel or tire could be rolled.

Mr. CHAPMAN said that a large proportion of the tires now rolled had this bevel on the outer edge.

Mr. JOHANN had for years been accustomed to buy his tires bored to gauge, furnishing the gauges for boring to the makers. He had had cases where an engine had been furnished with a new set of tires in four hours, without losing its regular trip.

Mr. VERBRYCK, President of the Master Car-Builders' Association, entered the room at this point, and was unanimously invited to a seat on the platform.

Mr. SPRAGUE thought it would be necessary to have gauges to check the makers' work.

Mr. CHAPMAN thought that every road should have standard gauges. He mentioned one where a new set of tires for one locomotive required four different sizes of bore.

Mr. HOWISON urged the importance of adhering to standard when adopted.

Mr. LAUDER asked what the increase of price was where ties were furnished bored to gauge.

Mr. CHAPMAN: Half a cent a pound.

Mr. LAUDER thought competition would regulate this matter.

Mr. MCKENZIE moved the adoption of the standard sizes of centres recommended.

Mr. SPRAGUE moved to add 60 in. to the list.

Mr. CHAPMAN said that he had known cases where an old tire had been turned down and used as a shive or band, and a new tire put on over them.

Mr. COOPER had eight engines which had been treated this way, and had run for four years without any trouble.

Mr. LAUDER deprecated multiplication of sizes.

Mr. JOHANN was ready to use standard sizes, and would find a way to make his engines conform to them. The sizes recommended by the committee were very close to those generally in use. He also opposed any addition to the sizes recommended.

Mr. SPRAGUE thought 60 in. a desirable size.

Mr. SPRAGUE'S amendment was voted on and lost. The committee report on size of wheel centres was then adopted.

On motion, the committee was continued for one year, with instructions to consider the question of form of tire.

Mr. SINCLAIR said that the sizes adopted were all, with one exception, too large for elevated roads, and these roads were a growing class.

Mr. JOHANN called attention to the necessity of having standard gauges, and procuring them from one firm.

Mr. GORDON moved that the committee be instructed to make arrangements with some firm to supply standard gauges. Carried.

Mr. LAUDER said that the committee had not considered narrow-gauge roads, as that gauge was gradually disappearing.

The discussion was then closed.

The Committee on Assessments then reported, recommending that the assessment for the ensuing year be fixed at $5. Adopted. A recess of ten minutes was taken, to allow members to pay up.

After recess, the time arrived for the submission of questions for discussion. The questions submitted were as follows:

1. Mr. WOODCOCK: Is it desirable to continue the use of Steel for Driving Axles?

Mr. WOODCOCK said he had found no trouble with steel, but he was informed that others had gone back to iron.

Mr. LAUDER opposed the use of steel, and, after giving it a test, had gone back to iron as necessary for safety. He had not, however, used crucible steel, but open-hearth steel only. Some cases he had known of failure were due to faulty design and especially to sharp corners on the wheel fit. They had had several recent cases of failure of steel axles. Steel might give good results, but he had not seen them. He preferred iron, not only for safety, but also for its wearing qualities. The texture and formation of iron seemed to permit better lubrication, and journals would not run hot so often. Steel would break in curious and unexpected ways and would fail at what were apparently the strongest points.

Mr. WOODCOCK'S experience with driving axles had been just the reverse of Mr. Lauder's. He had iron axles beat in the journal and found longitudinal seams in the iron. The difficulty was to get iron axles homogeneous.

Mr. MCCRUM had no trouble with steel axles breaking in an extensive experience with them. He thought, however, iron journals did not heat as readily as steel.

Mr. LAUDER again referred to the bad effect of sharp corners in steel. He adhered to his preference for good iron as the best material.

Mr. MCCRUM said that they carefully avoided sharp corners. There was nearly ⅛ in. difference between journal and wheel-fit, and this was not a sharp corner. He thought it well to make journal and wheel-fit the same size.

Mr. SINCLAIR had found much difference in opinion. As a rule he thought steel best, but steel was much more injured by faulty design. The elevated roads in New York had made careful experiments with steel and iron for axles, and found steel the most reliable material. Iron might be better than steel, but its life was very much more uncertain. Iron also was apt to develop cracks in the journals, which interfered with lubrication.

Mr. BALL expressed a decided preference for steel. They carefully avoided all sharp corners. The New York Elevated people had gauged their steel axles so that they could get within 10,000 miles of their life.

2. Mr. SETCHEL. The proper method of fitting braces on lines in Truck Axle Boxes.

Mr. SETCHEL said that he had adopted the plan of fitting boxes very closely to the axle, but some people objected to this, claiming that there should be room at the side. He planed up his axle boxes on both faces, but he had seen a road where they put in their boxes rough and did not even face the hub of the wheel.

Mr. BRIGGS asked what road.

Mr. MCKENZIE asked what play they allowed.

Mr. SETCHEL said it was the Ohio Central. They allowed ½ in. play (laughter).

Mr. MCKENZIE could see no economy in such work. He believed in accurate fitting on a truck.

The general discussion was then closed.

Mr. THOMAS SHORE was proposed as an associate member. Nomination referred to Messrs. Lauder, Meehan and Stewart as a special committee.

The Fitchburg Railroad offered members transportation to North Adams and return on Thursday.

The Committee on Driving Wheel Brakes was then called on. The report was read by President BARNETT, Mr. WOODCOCK taking the chair.

The report called attention to the differences between sliding and rolling friction. The primary object of the brakes was to convert the friction of wheel on rail from rolling to sliding friction.

The Committee went into a careful analysis of the conditions involved in the stopping of a train by brakes. The report was long and elaborate, and it is not possible to report it properly in a summary. The answers received from members to the Committee's circular were for the most part in favor of using driver-brakes on all classes of engines; nearly all favored their use on freight and yard engines.

The Committee think that the question of applying driver brakes should be taken up and discussed now, before their use should be required or compelled by legislation.

The Committee discussed at much length the question of the best material for brake-shoes and the proper position of brake, concluding that cast-iron, with abundant surface, is the most economical material, and that the brakes should be hung as low as possible, to clear the track.

The report discussed in succession the Chatellier counter-pressure brake; the Wallis steam brake; the Beal steam brake, and other forms of steam, air and vacuum brakes, making no specific recommendations. It was accompanied by a large number of drawings and blue prints.

Appended to the report were some notes from Mr. W. W. Evans on the increase of wear on tires caused by the use of driver brakes.

The report was received and opened for discussion.

Mr. BARNETT said that the general opinion seemed to be that driver-brakes should be frequently used, and that their use was safe.

Mr. WHITNEY asked for experience of members as to wear on journals and side-rod journals where driver-brakes were used. With brakes between the wheels they had had much trouble in this respect.

Mr. LAUDER asked whether driver-brakes should be used on passenger engines for ordinary stops or only in an emergency. There was a great difference both of opinion and practice in this respect. If driver-brakes were used for ordinary stops, then there was no reserve force to be used to prevent accidents. On his road they used it only in cases of emergency. They were equipping all their engines with driver-brakes.

Mr. BALL said that on the Elevated roads, where there are many stops, using the Eames brake, the engineers had used the driver brakes for making ordinary stops, and there was trouble from breaking driving-boxes. The bushings on the side-rods also wore very fast. They now used them as an emergency brake only.

Mr. JOHANN had begun to use driver-brakes 12 years ago; had used them for ordinary stops, but had never had any trouble with journal-boxes or side-rods.

Mr. WHITNEY decidedly favored the use of the driver-brake for all stops. The brake was to be used, and the heaviest vehicle in the train was the place to apply it. He also favored making the driver-brake automatic, so that it could be applied from the train in case of emergency.

Mr. SHAVER believed the driver-brake should be used for all stops. He had had no more trouble with driving-boxes or side-rods than he did before using it.

Mr. SINCLAIR favored general use of these brakes.

Mr. BALL said that their brakes were applied between the wheels and forced the wheels apart. He believed that it

was best to apply the brakes outside. He believed in keeping the driver-brake for emergencies. He mentioned one case where flat spots had been taken out of driving wheels with the brake.

Mr. JOHANN believed in using the brake for all stops.

Mr. HACKNEY said that they were using the Chatellier brake on the Atchison road on the mountain sections. They found it best to connect the driver-brake with the train brakes. The brake was used on grade of 185 ft. to the mile, 9 miles long, with very excellent results.

Mr. BARNETT said that no difficulty had been found on his road with brakes between the drivers.

Mr. LAUDER adhered to his opinion that the driver brake should not be used for ordinary stops.

Mr. ETTENGER said that they had recently adopted driver brakes. He had watched the brakes carefully and found no appreciable difference in wear resulting from their use.

Mr. HACKNEY said that the Westinghouse brake on the cars was used in connection with the Chatellier brake on the engine.

The discussion was then closed.

The Auditing Committee reported that the accounts and vouchers had been examined and found correct.

The Convention then adjourned until 9 o'clock on Friday morning.

After the adjournment on Wednesday, the members were taken in carriages through Charlestown, Cambridge and other suburbs. Some accepted the courtesy of the Boston, Revere Beach & Lynn Co. and made a trip to Point of Pines.

On Thursday most of the members took part in the trip down the harbor on the steamer "Empire State," much enjoying the trip and the generous lunch provided. Others went over the Fitchburg road to North Adams, through the Hoosac Tunnel.

EXHIBITS AT THE CONVENTION.

The exhibits at the convention were few in number, largely from the fact that no place was provided in which they could be shown. At the last minute some of the exhibitors secured the use of a room in the hotel, but this afforded only very limited facilities.

Three steel-tired wheels were represented: The Thurber wheel, made by the Brooks Locomotive Works, by Mr. Thurber; the Dickson wheel, made by the Dickson Manufacturing Co. and represented by Mr. W. F. Coolbaugh, and the Arbel wrought-iron centre wheel, of the Society John Cockerill, Seraing, Belguim, represented by Mr. Eckstein, of New York. Mr. James Ferguson, of Bridgewater, Mass., represented the Ferguson steel-tired wheel, with wrought-iron or steel centre. For the reasons stated above, specimen wheels of each kind, which had been sent to Boston, could not be shown.

Mr. Ferguson, beside his wheel, exhibited the Ferguson patent balanced valve, which has been in use on locomotives, with good results.

The Mackedon Safety Plug & Valve Co. of Chicago exhibited the Mackedon safety plug for all boiler fittings, intended to prevent escape of steam in case of accident.

The Beals combined locomotive and tender brake was shown in a drawing by Mr. W. B. Guernsey, of Norwich, N. Y. An engine equipped with this brake was at the New York & New England passenger station.

Mr. W. B. Collins made a striking exhibit of the Lappin brake shoe, having side by side a new shoe and one lately removed from a car of the Manhattan Elevated road in New York after 10 months' service, during which it ran 30,000 miles, making 120,000 stops and losing 15 lbs. of its original weight of 20 lbs.

A specimen of the Colburn wood and paper brake shoe was shown. This shoe is also in experimental use on the Manhattan Elevated road.

Machine tools were few in number. Mr. A. E. Hawley showed several sizes of the Westcott lathe chuck and drill chuck, made by the Oneida Steam Engine & Foundry Co. at Oneida, N. Y.

C. F. Hall & Son, of Skaneatles, N. Y., had a neat and ingenious patent machine for refitting globe valves and valves of similar pattern.

H. M. Williamson & Co., No. 45 Dey street, New York, showed a patent wrench drill, specially adapted for locomotive work and the erecting shop.

The Noyes Manufacturing Co., manufacturers of lubricating oils, had an exhibit.

The Lacovia Manufacturing Co., of New York, showed specimens of a dark-colored fibrous waste manufactured by the company in Jamaica (West Indies), for which advantages are claimed over cotton waste.

The United States Car Axle Lubricating Co. (Cincinnati) exhibited its "common sense" oiler for journal boxes.

Lonergan & Co., of Philadelphia, had several of their well-known patent oilers and safety valves.

Mr. Wm. A. Hardy, of Fitchburg, Mass., had a number of specimens of his babbitt and other lining metals for journal boxes, and a model of an improved axle-box.

The Dodge railroad stand-pipe, made by the Sheffield Velocipede Car Co., at three Rivers, Mich., was represented by a very neat model. This stand-pipe has been illustrated in the *Gazette*.

Mr. O. H. Holt, representing the Peerless Manufacturing Co., of Louisville, Ky., had a working model of the Rice sand-molding machine. The new principle brought out in this machine is a pattern stationary and rigidly attached to the frame, pressure being applied from below to force the pattern up into the flask.

Mr. N. Lyon, of the Albany Locomotive Appliance Co., showed the Purves & Craven draw-bar for locomotives, which is used to throw part of the weight of the tender upon the locomotive drivers, to increase adhesion. This device is now in use on the Boston & Albany and the Delaware & Hudson Canal Co.'s lines.

The American Brake Co., of St. Louis; the Eames Vacuum Brake Co.; the Ajax Metal Co., and the Damascus Bronze Co. were all ably represented, but, for the reasons given above, made no actual exhibit.

The Bragg cinder-escape and draft-regulator was shown by drawings. It is now in use on the Fall Brook Coal Co.'s lines.

There were several exhibits belonging more to cars than locomotives, most of them being, however, inspected with interest by the Master Mechanics.

The Hewitt Car Door Co. had drawings of its freight car door.

Mr. W. Martin, of the Martin Anti-fire Car Heater Co., Dunkirk, N. Y., showed a very neat and ingenious metallic coupling for steam-pipes, used to make the connection between locomotive and cars in the Martin system of heating.

Car seats occupied a considerable portion of the exhibition room. The Hale & Kilburn Manufacturing Co., of Phil adelphia, showed several seats of different patterns.

Mr. Henry Roberts, of Hartford, Conn., showed several of his woven-wire seats of different patterns. One of these seats was fitted with a neat device by which the seat can be adjusted at any angle by a slight motion of the seat arm.

The Wakefield Rattan Co., of Boston, showed several seats, including a chair for a drawing-room car.

Mr. E. L. Bushnell, of Poughkeepsie, N. Y., showed specimens of seat-springs framed and ready for use, and a finished car seat; also the Acme hair-picker, used in preparing hair for stuffing seats.

Last, but not least, Mr. M. N. Forney exhibited two of his improved seats, lately illustrated in the *Gazette*. The best exhibition of these seats seen by the writer, however, was in a New York & New England car, in which he had the good fortune to make the trip from New York to Boston. This car was furnished with the Forney seat, and the ease and comfort attending the journey were emphatic testimonials to the excellence of the seat.

A model of the Mack Elevated road interested many; this is the invention of Mr. W. B. Mack, inventor of the well-known Mack injector.

The Master Mechanics did not altogether escape the coupler question, the Fennell Automatic Car Coupler Co., of Skaneateles, N. Y., submitting a model of its coupler to their inspection.

The United States car coupler was represented by Mr. A. R. Tinkham.

Mr. H. A. Little, representing the Concave Elliptic Spring Co., shows models of the concave elliptic spring.

The Litofuge Manufacturing Co., of New York, shows specimens of its compounds for removing and preventing scale in boilers

The Walker Wrench Co., of New York, has several specimens of the Walker patent wrench.

J. & H. Tyler, of Montreal, show a model of O'Neil's patent semaphore signal.

Glines' Patent Car Brake Co., of Boston, is represented by a model of a truck with the Glines brake.

The Detroit Steel & Spring Works show specimens of Farrell's bandless spring for locomotives.

Mr. A. R. Tinkham, of Boston, shows the Clough sliding door handle for baggage cars.

The Bush Interlocking Bolt Co., of Philadelphia, has models of the Bush track-bolts.

The Deoxidized Metal Co., of Bridgeport, Conn., Mr. W. W. Keys, Superintendent, has some very beautiful specimens of its car trimmings, which, it is claimed, will not tarnish. This company also shows some fine specimens of journal bearings. One set of bearings of this company's metal has been in continuous use since October, 1884; another set has a record of 130,000 miles in actual service under a car, and is still running.

The Hancock Inspirator Co., of Boston, presents its injectors.

The Craig Sight Feed Lubricator Co., of Lawrence, Mass., has its sight feed lubricators for locomotive and other engines.

The Locomotive Improvement Co., of Toledo, O., brings to the notice of the master mechanics several devices for use on locomotives, including a traction-increaser, by which the weight of the tender can be used to increase adhesion; a steel or malleable iron brake-beam; the Conway safety sling to hold trucks in place in case of derailment; a portable car signal to protect the rear of trains, and the Bennett patent car-brake ratchet or clutch. The traction-increaser has had extended trials in actual service.

The Eames Vacuum Brake Co. is represented by a very handsome model of a locomotive and car fitted with the Eames automatic brake, and several specimens of the patent hose used for connections.

The Smith & Owen Heater Co., of Detroit, Mich., exhibit the Smith car heater.

CONVENTION NOTES.

The new members who joined at this meeting are as follows:

Ball, Charles A., Brooklyn Elevated.
Walker, C. W., Seaboard & Roanoke.
Ettenger, G. W., Chesapeake & Ohio.
Clark, Isaac W., Cape Fear & Yadkin Valley.
Weisgerber, E. L., Baltimore & Ohio.
Twombly, Arthur W., Old Colony.
Smart, C. E., Michigan Central.
Ames, L. M., Beech Creek, Clearfield & Southwestern.
Hobart, C. C., Oregon Railway & Navigation Co.
Kolseth, Henry S., Boston & Lowell, Southern Division.
Wilard, Daniel, Minneapolis, Sault Ste. Marie & Atlantic.
Flahavan, Wm. M., Pittsburgh & Western.

In its unanimous vote on the second day, after the little breeze raised over the annual report of last year, the convention showed that it could sit down emphatically upon a crank, if necessary. The general temper of the meeting is good-natured, and it takes some time to wake it up fully to the situation. This was the case on Tuesday, when too much time was wasted on a matter which should have been settled in 10 minutes; but when the situation was realized, the convention sat down very hard indeed, and it emphasized this on the following morning, when a resolution was unanimously adopted dropping the offending party from the roll on the ground that he was not and never had been properly qualified for membership.

Mr. Barnett made an excellent presiding officer—vigilant, quick and thoroughly intent on forwarding the business of the convention. In the opening session he asked for indulgence, on account of ignorance of parliamentary law. Such ignorance, however, was not apparent, and, if it really existed, was more than made up for by a simple and direct earnestness which carried the convention with it. The Association is not an unruly body; it needs spurring up rather than curbing generally, and just this service the President is well qualified to perform.

There is a perceptible growth of the younger element in the Association. All, or nearly all, the new members belong to that class. There is a tendency, however, among the younger men to sit still and listen, leaving the grey-beards to carry on the discussions. Modesty is a virtue, but it may be carried to excess, and the younger men should let themselves be heard.

The New England Railroad Club was an admirable host, and the courtesies extended to visiting members were hearty, and were thoroughly appreciated. The drives and the harbor excursion were pleasant and well managed, and were much enjoyed.

The President's Address to the Master Mechanics' Association.

We give below in full the excellent address made by President J. Davis Barnett at the opening of the Master Mechanics' Convention in Boston, on Tuesday:

LADIES AND GENTLEMEN: It is a real pleasure to meet with you and greet you once again. Your happy faces tell a tale of good health, of high spirits, and of ability to respond to and enjoy, not only the civic hospitality so kindly extended to us by this good city, but to appreciate all its other good things.

I have often expressed my personal feeling that Boston is the most charming city to visit on this continent. I regret that I was not a member, and therefore had not the pleasure of attending the convention that was held here 14 years ago (1872), yet those who were—I know by their vivid recollections of that time—have most happy remembrances of the right hearty way in which our Association was welcomed, and its financial position then strengthened; and we believe that the warm words of welcome we have just heard from His Honor Mayor O'Brien are a genuine expression of Boston's feeling toward us.

I am glad to say our Treasurer's and Secretary's reports are encouraging; they show an unspent balance, and our membership has not lessened, although to our sorrow and regret, since last we met five members have gone over to the majority. May they rest in peace!

It is possible that the change of mileage from broad to standard, carried out during the last few days in the Southern States, may yet keep the members there resident so busy that we shall not see all of them this year. Should this unfortunately prove to be the case. I much regret that the dates should have fallen so close together as to make it impossible for all to attend this meeting, which I had hoped, and still shall hope, will not fall behind any previous one either in attendance, interest or educational value.

That the ladies continue to favor us with their presence and kind smiles is a matter of happy congratulation, and they must not think my thanks are not real, and the words are feigned, even if they do come from a bachelor.

This morning, more particularly to our working and junior members, I wish to speak a few words on the "Uncertain in Locomotive Engineering" and how we can best reduce it. The certain is the concrete results of past experience; it is familiar, prosaic, and it fails to keenly interest or stir us; but that which is still uncertain, still undefined, the test or experiment our friend has in hand, the problem we are trying to solve—these unconsciously draw out our enthusiasm; as we thus hope to obtain one more point of indisputable fact, to make the foundation of our daily practice more firm, to take another and a closer grip on nature: and it is this continually obtaining, this breaking down of the barriers, this wider survey and clearer plotting of what recently was an unknown territory, that gives the growing interest to our profession, and to these our annual reunions.

Critics (and not necessarily unfriendly critics) have said that individually in convention we make contradictory statements, and collectively our published proceedings are conspicuous by the absence of definite conclusions and formulated results.

It seems to me that there is small cause for wonder that statements appear to be contradictory, when it is considered how numerous are the differences in metal, in fuel (and can I add, in men); how great the variation in service the materials are put to, and also over how many substances one word is stretched to cover. May I illustrate? We commonly use the words "soft coal" as if it were a single definite, almost elementary substance, ignoring the fact that the varieties from the same bed and seam are numerous, and that two specimens which chemical analysis shows to have practically equal percentages of the same constituents are seen to behave very differently when distilling on the grade, yielding different residues, as well as showing large variation in calorific power.

"Steel" is another common instance in illustration. What a bewildering variety of substances, with highly differentiated qualities, does this little word cover, and how wide the differences necessary in its treatment, from tool steel injured by high heat, to boiler plate which is made dangerous to human life if it has been worked at low or colorless heats.

Therefore, when circumstances so greatly differ, and the use of a similar word is so far from implying that a similar substance is referred to, should it be a matter of surprise if a member's statement that so and so is *black* is directly followed by another's that it is *white*? The thought I desire to impress upon you is the necessity for noting and fully stating all the qualifications or circumstances limiting the observed fact; we shall then see these apparently diverse statements fall into parallel lines, and the conclusion (in many, if not most cases, indorsed by the majority) shows that it is *grey*, or a mixture of both black and white.

All the circumstances qualifying, influencing or seemingly only coincident with an observed experiment, should be noted. For the trend of modern scientific research is to show that it is the small circumstance (so small and apparently so trivial as to be overlooked for years) that proves to be the missing link, the missing ward in the key that unlocks the puzzle, showing the complete yet simple operation of cause and effect.

We need to educate the closely observant eye that will *not* be deceived by superficial appearance into lazily concluding that the apparently familiar result is exactly the old, well-known incident, with nothing but the old lesson to teach and the old law to enforce.

Hence the value of seeing any fact in physics, or any experiment, with our own eyes; and also, because of the liability to usual deception of seeing the same thing through the eyes and mind of one or more independent observers, of noting the points brought out, that to them seem most prominent and closely related, the sequence or order in which they follow, and their relative proportion to and influence the one on the other.

We can, I think, best get into this good habit—considering the pressing limitations due to time and business calls—by free mutual exchange of experiences, and our Association is based on that belief; but each statement we make, to be current at its full value, must be specific—something more than a flat contradiction, or an "I don't think so." Let us strive to give the *why*, as well as to state the naked fact that in our observation it *is* so.

We can by striving get the *why;* for it is certain that regularity and eternal law reign throughout the most diverse results. This is our unshaken foundation. If results seem to vary, it is because we either do not know, or have not observed, the conditions that insure success. The defect is in ourselves, for nature's laws know "neither variableness nor shadow of turning." Open eyes, unblinking observation, energy and freedom from foregone conclusions, are necessary: not that nature is deceitful, but she does not disclose her hidden charms except to those who ardently seek them.

Foregone conclusions are a fruitful source of error. Let us for an illustration turn again to steel, used successfully to sustain rolling friction, yet a failure when inferential reasoning led to its application to resist rubbing or sliding friction. To make a fair trial of the rolling of steel tires on steel rails was to recommend the exclusive use of steel; it did its work so well, had so long a life, so little frictional resistance and possessed such high powers for resisting abrasion; yet the attempt to *slide* one polished steel face upon another, as an eccentric inside its strap, or a cross-head upon its slide-bar, has not to-day reached the stage of successful experiment.

It is now clear that any inference obtained from experiment in rolling friction between metals will not apply to sliding friction; to think you can do so is a futile attempt to get at nature's law by a foregone conclusion. The same may be said of any attempt to apply resistance rules deduced from friction at low velocities to practice at high velocities,

and it was unwise to expect that boiler plate with 1-300 part of carbon would behave the same as if it contained but the 1-700 part, or even a more minute fractional part of phosphorus.

These are trite examples, but they the better serve to emphasize the necessity for clear discrimination between things that seem to differ (if at all) but very slightly, and also to remind us to properly qualify and elucidate our statements, and to closely observe the small things.

Dr. G. Gore has shown how widespread and inclusive are the influences of seemingly small causes. Thus warmth, or even moderate pressure, applied to a piece of steel definitely and in most cases measurably altered its "length, breadth, thickness, molecular arrangement, atomic distance, specific gravity, cohesive power, adhesion to liquids, elasticity, temperature, specific heat, latent heat, thermic conductivity, thermo-electric power, electric conduction, resistance, magnetic capacity, chemical and chemico-electric actions, and a number of other properties simultaneously," so that his vivid experiments almost produce the impression that this metal is endowed with vitality.

Thus, although we need not pay attention to all these points, you see that if we treat metal as inert, and stable under all except extreme variations of temperature and pressure, we shall be deceived, and find our attempted application of experimental results to daily practice very disappointing; but if we carefully discriminate and notice the small signs we shall make fewer mistakes, have less failures in daily work, do something to lessen the still wide field of the uncertain, and increase the present narrow swath of the known and certain.

May I now thank you for the kind and considerate attention with which you have listened to this dry prosing. Remember, in extenuation, that it is the nineteenth year you have listened to an address from the chair, and the possibilities of something new and interesting to all seem—at least to me—very limited.

THE MASTER CAR-BUILDERS' ASSOCIATION.

Twentieth Annual Convention.

The proceedings on the two first days of this Convention, June 8 and 9, have been already noticed in the previous issue of the *Gazette*.

THIRD DAY'S PROCEEDINGS.

On the third day of the Convention the Treasurer, Mr. John Kirby, presented his annual report which may be summarized as follows:

Balance from previous year	$1,014	Expenditure	$4,148
Receipts	3,238	Balance	104
	$4,252		$4,252

It will thus be observed that, though a balance of $104 remains, the expenditure has exceeded the receipts by $910. It was subsequently announced, however, that the Executive Committee had decided not to raise the annual assessment above the present amount, $5 per vote.

It was understood that the Secretary, Mr. Forney, had suggested that his salary be $2,000 instead of $2,500.

The Auditing Committee reported that they had examined the accounts and found them correct.

Mr. FORNEY gave notice that next year he would propose an amendment to the Constitution, Article III., Section 3, the second sentence of which as amended will then read thus, the added words being in italics:

"Such (representative) member shall have all the privileges of an Active Member, including one vote on all questions, and in addition thereto shall on all measures pertaining to the adoption of standards or the expenditure of money *or the Rules of Interchange* have one more vote for each full one thousand cars which are owned, or which are in use and in process of purchase, by the road or system which he represents."

It was resolved that the Amendment to the Constitution proposed last year and discussed during the first day's proceedings* be laid over till next year.

The effect of this resolution will be to leave the appointment of the various committees entirely in the hands of the President.

The report of the Committee on Standard Dimensions of Freight Cars was called for, but no member of the committee was present, and a new committee was appointed.

The report of the Committee on Standard Draw-gear for Non-automatic Couplers was not accepted, and a new committee was appointed.

The Committee on Appliances to Prevent the Slipping of Wheels on both Passenger and Freight Cars presented a report which, after describing several devices, stated:

"Your committee has not learned enough of definite and reliable results from the use of the appliances reported to warrant them in expressing any opinion as to their merits. In view of the importance of the subject we trust there will be a full discussion, and would recommend its further consideration by a new committee."

M. P. FORD,
H. H. ROBERTS,
J. P. COULTER. } Committee.

Mr. JOHN KIRBY stated that in passenger service he used 70 lbs. air pressure, levers 9 in. and 27 in., dead lever 6 in. and 18 in., the cylinder lever being 30 in. long with hole in the centre. The levers and brake rigging were the same for all cars, but the cylinder lever was changed for light cars (15 windows a side) to 20 in. and 10 in. Notwithstanding these precautions, wheels are slid.

Mr. BLACKALL suggested that all main engine reservoirs should be provided with a safety valve set at 60 lbs.

Mr. FORSYTH said that this was objectionable, as some extra pressure was useful to release the brakes. The 90 lbs. on engine was 20 lbs. above the train pipe pressure.

Mr. W. B. SNOW suggested that the safety valve be placed between the auxiliary reservoir and the cylinder.

Mr. JOHN KIRBY stated that the trains making fewest stops had most slid wheels. This was due to unequal pressure.

It was resolved that the subject be referred to another committee.

The report of the Committee on Standard Height of Draw-bars for Passenger Cars was then read, and their recommendation was referred to letter ballot.

REPORT ON STANDARD HEIGHT OF DRAW-BARS FOR PASSENGER CARS.

Your committee on investigating the height of the Miller draw-bar find that at the Convention held in Chicago in June, 1869, 36 in. was recommended as the standard height of draw-bars for passenger cars, and at the Convention held at Richmond in June, 1871, the height was fixed at 33 in.

In order to ascertain what the practice is at the present time, your committee issued a circular asking the following questions:

1. Do you use Miller draw-bars upon the cars run in your passenger equipment?
2. If yes, will you please state how many cars you have which are so equipped?
3. Also, please state what is the standard height of these draw-bars as adopted by you, measured from the level of the top of rail to the centre of the Miller draw-hook?

In answer to this circular, we received replies from one hundred roads, representing twelve thousand and seventy-nine (12,079) cars, equipped with the Miller draw-bar.

1 road,	representing	6	cars, height of draw-bar,	32	in.
19 roads,	"	2,452	" " "	33	"
2 roads,	"	46	" " "	33½	"
26 roads,	"	4,387	" " "	34	"
5 roads,	"	1,195	" " "	34½	"
19 roads,	"	2,472	" " "	35	"
1 road,	"	310	" " "	35½	"
5 roads,	"	581	" " "	36	"
2 roads,	"	630	" " "	36½	"

An average height of 34¼ in.

In view of the fact that some roads are using wheels larger in diameter than formerly, your Committee does not think it advisable to recommend the standard of thirty-three (33) inches proposed at Richmond; nor do we approve of thirty-six (36) inches, as was proposed at Chicago.

As a compromise measure, and one that will meet the average height of draw-bars on cars now running, we recommend that the standard height of draw-bars for passenger cars be 34¼ in. from the level of the top of rail to the centre of the hook.

JNO. S. LENTZ,
ROBT. MCKENNA, } Committee.

The Committee on Revising the Rules of Interchange, having previously made their report, were discharged.

Mr. J. W. MARDEN asked why the Committee on Freight car Couplers discouraged the further experiments with couplers of the Miller type.

Mr. F. D. ADAMS said the Committee had only reported progress and, therefore, had a right to withhold information. Inferences must not be drawn until the matter is finally reported on.

Mr. J. W. MARDEN said when the time came he would adopt any one freight coupler decided on by the majority by letter ballot. He considered that all twelve couplers should be continued on trial.

Mr. ADAMS declined to give reasons until the Executive Committee were through, when a complete statement and explanation would be given. At the next Convention, when the Committee will possess detailed information as to the performance of all the couplers, full reports will be given.

Mr. MARDEN had adopted the Cowell as a vertical plane coupler, and as it had done well on his road, wished to know why it had been discarded by the Committee.

Mr. RHODES supported the Committee, and did not wish to ask questions or judge their actions until they had made their final report.

Mr. MARDEN: Any report of the Executive Committee carries a great deal of weight, and therefore they should have mentioned no names until they had made final report.

Mr. BLACKALL said that the Committee were continuing their tests.

Mr. GAREY said that the Executive Committee were entitled to great respect, but he was surprised at their report in indorsing only the Janney type of vertical coupler. The Miller had done well on passenger cars and why was it excluded from consideration in freight cars?

Mr. ADAMS said the committee deemed it proper to withhold certain portions of their report and denied that any of the twelve couplers are excluded from further trials. Reports as to certain matters are withheld for the present, and the Association should exercise a little patience.

Mr. MCILWAINE was glad to hear the explanation.

Mr. FORNEY read extract from report of committee "most worthy of trial."

Mr. MARDEN thought the Committee should not have delivered a verdict without giving the evidence.

The PRESIDENT defended the report.

After some further discussion:

The PRESIDENT said that some couplers were not yet on cars. The Dowling, for instance, was not yet on the Chicago, Rock Island & Pacific cars, delays being caused by the efforts to make the Dowling couple with other vertical hook couplers.

Mr. SANFORD KEELER moved that the Executive Committee be instructed to place the Cowell coupler for trial on the Detroit, Lansing & Northern road. Carried.

Mr. LENTZ stated that the Gifford coupler was not yet ready for application on the Lehigh Valley cars.

The choice of subjects to be reported on at the next annual convention was referred to the Executive Committee.

The President and the other officers were then re-elected unanimously.

The PRESIDENT, who spoke with much feeling, thanked the members for his re-election and said he highly appreciated the compliment paid him.

Mr. BLACKALL moved that the next place of meeting be Alexandria Bay, in the Thousand Islands.

Mr. MCILWAINE suggested Minneapolis or St. Paul.

Mr. ADAMS supported Mr. McIlwaine, and the proposition was carried by a large majority, Mr. Adams having used a strong argument in stating that the ladies were all in favor of St. Paul or Minneapolis.

Mr. ADAMS gave notice of an amendment to the Constitution to empower the Executive Committee to fill up vacancies in their body.

Mr. RHODES was in favor of printing discussion on Rules of Interchange as it would elucidate the Rules.

Mr. BRADY (New York Central) moved this be done and included in the Annual Report. Carried.

The Convention then adjourned until the Second Tuesday in June, 1887, when it will meet at Minneapolis or St. Paul, as may be decided upon.

THE LEHIGH VALLEY SPECIAL TRAIN.

The Lehigh Valley Railroad provided a special train for the use of those attending the Master Car-Builders' Convention. This train left Jersey City on Monday morning, and on the return journey left Niagara Falls on Friday morning. The train was composed of five coaches, including two Worcester excursion cars kindly lent by the Worcester Excursion Car Company. The remainder of the train consisted of a very comfortable and well arranged directors' car, a standard first-class car, and a baggage or express car, all belonging to the Lehigh Valley. All the cars rode well, and were much admired, but the very complete fittings of the last-mentioned car received the closest attention of the visitors, and were carefully inspected by the numerous experienced travelers present, who subjected the fittings to repeated practical tests with apparently entirely satisfactory results.

Mr. R. H. Wilbur, Assistant Superintendent of the road, acted as host, and was unremitting in his attention and courtesy to all present, and with the aid of Mr. J. S. Lentz, and Mr. Shuey succeeded in giving his guests an exceedingly pleasant ride through the splendid scenery of the Lehigh Valley. The fast running made by the "Grover Cleveland" and other engines drawing the train, the good condition of the freight cars passed *en route*, the clean and well-built stations, and the excellence of the permanent way excited in prosaic minds as much admiration as the scenery.

The writer subjected the excellence of the line and surface of the road to a severe test, considering the sharpness of the curves and the heavy coal traffic conveyed. Standing on the rear platform of one car, and bringing a point on the under side of the next platform in line with the centre of the rail, the point would not travel beyond the width of the rail-head while the car was on the same curve. The total side oscillation of the body of a passenger and of the end platforms of two cars thus amounted in all to less than 2 in., a most excellent result, upon which the permanent way department is to be congratulated.

Additional facilities for attending the convention were also afforded by the New York Central, Boston & Albany and other lines.

The Master Car-Builders' Convention—Revision of the Rules of Interchange.

The concluding session of the convention was chiefly occupied in revising the "Rules of Interchange," a code governing the condition of and repairs to freight cars for the interchange of traffic. The existing rules, in a somewhat modified form, have been codified by a committee appointed for that purpose,* and their work having been revised by the Executive Committee, the rules, as thus amended, were brought before the convention and discussed seriatim.

A very full discussion of the rules took place, Mr. W. McWood (Grand Trunk) being in the chair. The principal alterations made were as follows:

In Rule 3, section *i*, the minimum diameter of journals was, after considerable discussion, finally fixed as under:

60,000 lbs. car	Unit,	3⅝ in.
50,000 "	"	3⅜ in.
40,000 "	"	3⅛ in.
30,000 "	"	2¾ in

Rule 13 as proposed by the committee was renumbered as Rule 12, and after giving a schedule of prices for new, second-hand and scrap material, was modified as under:

"And with an additional charge of $1.50 for each pair of wheels and axles removed from the truck."

The form of bill for wheel and axle work was finally amended as follows:

.....

To..... .. ..R R. Co., Dr.

For wheels and axles used under....cars. Month of....188..

Date and place	Initial, kind and number of cars	Wheels or Axles removed. Maker	Date cast	Number	Cause of removal	Shop marks on wheels or axles	Wheels and Axles Applied. Maker	Date cast	Number	New or second hand	Net material charge	Labor charge	Total net charge

Rule 16 as originally proposed becomes Rule 15, and a new Rule 16 as under was adopted:

"RULE 16—Wheels on same axle must be of the same circumference.

"New wheels must not be mated with second-hand wheels.

"Prick-punching or shimming the wheel-fit must not be allowed.

"Wheels applied must be marked on inside with date of application.

"The wheel seats of foreign axles must not be reduced to fit wheels, but the wheels must be bored to fit axles."

No alterations of any moment were made until Rule 22 was reached. A new style of car, the 50,000 lbs. hopper-bottom gondola, was added at the request of Mr. Brady (New York Central), who spoke at the request of the Fall Brook and Beech Creek & Southwestern Coal companies. The length of the longest cars was modified to read "32 ft. or over" instead of "33 ft. or over." As the rule stood, no provision was made for cars over 32 ft. and under 33 ft. long, an obvious omission. The rule as finally amended reads as follows:

"RULE 22. The settlement prices for new cars and trucks shall be as follows:

Box car, eight wheel, 32 ft. long or over	$450
" " " under 32 ft. long	430
Stock car, eight wheel, 32 ft. long or over	450
Stock car, eight wheel, under 32 ft. long	435
Gondola car, eight wheel, Drop-bottom, 20 tons or over	400
" " " " " " 15 " " less	375
" " " " Hopper bottom, 25 tons	450
" " " " " " 20 " or over	425
" " " " " " 15 " " less	400
" " " " plain, 32 ft. long or over	325
" " " " " under 32 ft. long	300
Flat car, eight wheel, plain, 32 ft. long or over	300
" " " " " under 32 ft. long	290
Box car, four wheel	230
Coal car, four wheel, ordinary	200
Gondola car, four wheel, drop bottom	200
Trucks, car, four wheel, 1 pair	200

"Depreciation due to age shall be estimated at 6 per cent. per annum upon the yearly depreciated value of bodies and trucks, provided, however, that allowances for depreciation shall in no case exceed 60 per cent. of the value new."

It will be observed that the alterations in prices are small, and all tend to show a reduction in the value of rolling stock.

The following addition was made to Rule 25.

	Charges.	Credit.
One box or stock side-door	$5.00	....
One box or stock end-door	3.00	....

After considerable discussion, the words in italics were added to Rule 29:

"In case of any dispute or question arising under these

* See first column, page 395, *Railroad Gazette*, June 11 1886.

* This proposed Code of Rules of Interchange of Cars was published in the *Railroad Gazette*, May 21, 1886, pages 345, 346.

rules, the same *may, by mutual consent*, be referred to the Executive Committee, whose duty it shall be to decide the case."

TRIALS OF CAR COUPLERS, ETC.

In addition to the car couplers exhibited in the piazza of the International Hotel at Niagara Falls, several inventors sent freight cars fully equipped with their couplers, and held trials on the tracks of the New York Central and Erie respectively. The following couplers were thus represented:

Aikman*....1. Loose link.
Ames.....2. Fixed link.
Barnes.....3. Janney type gravity lock and opener.
Cowell.....4. Miller type with swinging head.
Dowling.....5. Janney type modified knuckle spring opener.
Lorraine ....6. Janney type gravity lock, spring opener.
McKeen.....7. Loose link.
Marks.....8. Loose link.

All of these couplers, with the exception of the Ames, Cowell and Marks, are of recent introduction, having been either invented or materially modified since the date of the last Master Car-Builders' Convention. The Cowell coupler has also been modified since then, a gravity lock having been substituted for a spring lock, and an automatic attachment added for coupling with an ordinary link. This exhibit of couplers therefore presented many features of interest and novelty to the master car-builders assembled.

The trials were informal, and took place under the direction of the inventors. Those on the Erie track included trials between the Cowell, Gifford and McKeen, and were intended to show that all these couplers would couple automatically with one another, ordinary standard links being used.

Tests were also made of Mr. James Abbot's device for locking freight car doors from the top, the lock being operated and sealed in a recess cut in the running-board. Any tampering with the lock or seal can thus be detected at once by the brakeman more readily than when the car is locked at the sides, which are hidden from the sight of the men on top of the train.

A trial was also made of Cowell's car pusher. The writer, by means of this device, pushed two empty 60,000 lbs. cars with one hand with ease. The pusher is clamped to the end sill, and the car is propelled by a pair of legs acting alternately and pushing on the rail, both legs being operated by a hand lever worked downward like a pump-handle. The device does not act on the wheels, but propels the car by a direct push between the end sill and the rail-head.

In our notice last week of exhibits at the convention, a telegraphic error occurred in our description of the freight car trucks exhibited. The sentence should read: "Suzenmahl's anti-friction side-bearing consists of a roller, roller path, and link. Traver's car truck is exhibited and is of very simple construction, the swing beam being dispensed with, and a tubular casting replacing the ordinary truck transoms."

The New York State Car Coupler Trial.

The car coupler trials conducted by the Railroad Commissioners of the State of New York, Messrs. Rogers and Kernan, commenced on Wednesday, the 16th inst., as previously announced in the *Railroad Gazette*.

About sixty different devices were exhibited fitted on cars, and the merits of twenty of these devices were tested on Wednesday. The remaining couplers will be tried on Thursday and Friday, 17th and 18th inst.

The Commissioners state that their object is not to ascertain which is the best coupler, but which couplers fulfill the requirements of the law.

The Commissioners, by direct tests and by questions to inventors, appear to wish particularly to ascertain whether each variety of coupler exhibited—

1. Will couple with its own kind at slow speed.
2. " " " " " " " quick "
3. Can be set not to couple.
4. Can be uncoupled from its own kind with ease.
5. Can couple automatically with a standard link set in a common draw-head some 2½ inches below the standard height.

All the foregoing tests being made on straight track.

Before giving any further details as to the tests, it may be said that, without exception, none of the couplers tried passed the test No. 5 set forth above. Some ascribed the failure to the fact that the ordinary draw-head used permitted the link to go back too far, and others claimed that a coupling could be effected with a longer link. The Ames, Aikman and Thurber were successful in coupling with links slightly longer than the standard.

The following table gives the names in alphabetical order of the couplers tried, and shows how they behaved in tests 1, 2, 3 and 4:

	Test 1.	Test 2.	Test 3.	Test 4.
Adams, Felthousen & Lawtenslager	Yes	Yes	Yes	Yes
Aikman	Yes	Yes	Yes	Yes
Ames	Yes	Yes	Yes	Yes
Baldwin	Yes	Yes	Yes	Yes
Barnes	Yes	Yes	Yes	Yes
Boston	Yes	Yes	No	Yes
Cowell	Yes	Yes	Yes	Yes
Curtis & Wood	Yes	No / Yes	Yes	....
Dowling	....	....	....	....
Janney	Yes	Yes	Yes	Yes
Lorraine	Yes	Yes	Yes	Yes
Marks	Yes	Yes	Yes	Yes
McKeen	Yes	Yes	Yes	Yes
Sherman	Yes	Yes	No	....
Smillie	Yes	No	Yes	Yes
Thurber	Yes	Yes	No	Yes
Thurmond	Yes	Yes	Yes	Yes
United States	Yes	Yes	Yes	Yes
Wilson	Yes	....	No	....
Woods & Drake	Yes	Broke	....	....

Some of these couplers have been fully illustrated and described in these columns, but the Adams, Baldwin, Sherman, Thurber, Wilson, and Woods & Drake couplers are of recent origin, and little known to railroad men.

The Commissioners also appeared to attach importance to the following points, on which they questioned the representatives of the different couplers:

6. Can double dead-blocks on a dead wood be used?
7. If the knuckle, dog or analogous device breaks, how can it be removed and replaced? Can an ordinary pin be used in such cases?
8. Do the handles endanger persons going between the cars or working the couplings?
9. What is the cost of the couplers complete per car, including royalty?
10. Of what material is the coupler constructed
11. Is it in regular practical use on any railroad?
12. Has it been indorsed by the Master Car-Builders' Association or by any state authorities?

The inventors' replies to these inquiries, which were put *viva voce* during the trials, were necessarily more or less imperfect, and both questions and answers were moreover imperfectly heard and understood in many cases. The following comments will serve to elucidate matters, and embody a brief summary of the inventors' explanations and statements as to the special features of their different devices.

AIKMAN. Claim a superiority over other forms of rising and falling hook (Archer type), as the strain does not come on pin, but on a crotch or offset in the hook bar bearing against a corresponding offset in the draw-bar casting. This coupling has been running through the winter on the Grand Trunk. It performed especially well in coupling with a link in a common draw-head some 2½ in. below the standard height.

AMES. When set not to couple, the hooks in both heads were moved both by hand and lever. It was claimed that they could be moved by lever only in the latest improved style of this coupler. The couplers exhibited appeared, however, to be fresh from the paint shop. When set not to couple, the cars did not couple, but one hook was jerked forward and would have possibly coupled on the rebound. Can be uncoupled with one lever, if the right lever is selected, which is somewhat difficult at night.

BALDWIN. This coupler is in use on the Cincinnati, Wabash & Michigan. It consists of a hook rising and falling in a vertical plane, and operated by a flat spring. A very similar device was patented by Mr. Cowell (the inventor of the Cowell coupler) in 1874.

COWELL. Can be uncoupled with one lever; used by the Fitchburg, Lehigh Valley, Newburg, Dutchess & Connecticut, Boston & Providence, Providence & Worcester, New York, Providence & Boston, Detroit, Lansing & Northern, and Pennsylvania Company. This coupler has been fully illustrated in these columns.

CURTIS & WOOD. A link 13½ in. long can be carried inside the draw-bar, but is not fixed. The hook is cast steel, and it is claimed can be replaced in 15 minutes if broken. The cost of the coupler complete is given at $17. It is in use on the Philadelphia & Reading, Union Pacific, and 20 cars on the Delaware, Lackawanna & Western.

DOWLING. Trials were made to couple with the Janney, and were fairly successful. The knuckle was removed to show how quickly this can be done, and an ordinary pin somewhat bent by use was substituted for the proper locking device. Notwithstanding this the coupler operated perfectly. The arrangement as regards central buffer in line of sills was similar to Janney, no dead-blocks being used, but inventor explained that they can be used if necessary. Pin can be drawn or knuckle opened with one hand. Used on the Pittsburgh, Cincinnati & St. Louis.

JANNEY. The cars exhibited fitted with this coupler had a special arrangement of levers, which differed from that adopted by the makers in all other cars fitted. It was claimed that this arrangement was faulty, and owing partly to this and partly to some misunderstanding of orders, the coupling did not work perfectly. Trials were made to ascertain if the Janney would couple automatically with the Dowling, and this appears to be possible if the Dowling head be kept shut and the Janney knuckle left open, but not otherwise. The couplers and cars exhibited had been in use for some time, while all the other couplers appeared quite new.

LORRAINE. This vertical plane coupler has a knuckle hinging on the right-hand side of the head looking toward the coupler, and it will not therefore couple with the Janney and other left-handed vertical plane couplers. The inventor states, however, that he will alter this, and can make his device couple with the Janney. This coupler has been adopted on the 700 refrigerator cars of the St. Louis Refrigerator Car Company (Anheuser Busch Brewery).

MARKS. The inventor claims that it is more easily operated than the Archer, which is somewhat similar. The gear for working is underneath, so that the sills and dead-blocks are not cut away, and the drawhead is supported by links close to the face, where support is most needed. The height of the link can be controlled. An attachment for carrying a spare link is provided. Used on the Cleveland, Lorain & Wheeling; Flint & Pere Marquette; and Cleveland, Columbus, Cincinnati & Indianapolis.

MCKEEN. This coupler has been very recently illustrated in the *Gazette* and it is therefore hardly necessary to observe that it is of the class of loose link couplers, with pin supported by a gravity dog. The dog, the link controller, and the arrangement of levers for working are all very simple and well designed, and present a strong contrast to many of the crude contrivances exhibited. This coupler is in use on the Lehigh Valley, and Delaware, Lackawanna & Western.

SHERMAN. Loose link type with spring supported pin. The gearing appears somewhat complicated, and the link-controller in its present form would be soon damaged. Recent invention, not yet in use on any railroad.

SMILLIE. This coupler, which was tried at Buffalo in September last, and was illustrated in the *Gazette* of Oct. 2, 1885, has since been somewhat modified, the peculiar link connected loosely by its centre to the draw-head being abandoned, and a plain loose link substituted. This coupler is in use on the Delaware, Lackawanna & Western.

WILSON. This is of the loose link class, with a gravity dog, and is used on the Ulster & Delaware on a few cars. Old or broken pin can be removed and new pin substituted by removing cap in upper part of drawhead.

WOODS & DRAKE. Though the inventor claims to have had 50 years' railroad experience, his whole draw-bar fell to the ground after a moderately sharp "hit up."

* These couplers have been illustrated in the *Railroad Gazette* as follows: 1, May 28, 1886, page 364; 2, Oct. 2, 1885, page 627; 3, May 28, 1886, page 364; 4, Oct. 2, 1885, page 629; 5, Oct. 2, 1885, page 627; 6, Advertising columns, page XI.; 7, May 28, 1886, page 363; 8, Oct. 2, 1885, page 626.

An English Decision on Preferential Rates.

In a case recently decided the plaintiffs were the Hull, Barnsley & West Riding Junction Railway and Dock Company, and the defendants were the Yorkshire & Derbyshire Coal Company. The plaintiffs claimed £270 11s. 7d. for carriage of coal from the defendants' collieries in South Yorkshire to Hull. The defendants set up a counter claim for damages under the Railways Regulation Act, which prohibits railway companies from granting preferential rates for the carriage of merchandise to one trader over another. The case for the Yorkshire & Derbyshire Coal Company was founded upon certain through rates which the plaintiff company, in connection with the Midland Railway Company, had granted to other colliery owners in the district. The facts were not disputed, and both sides relied upon the opinion of the law lords in the recent case of the Denaby Main Company against the Manchester, Sheffield & Lincolnshire Railway Company.

The bearing of the decision in the case of the Denaby Main Company upon this case having been argued at some length, His Lordship gave judgment June 1. This was a question, he said, of considerable difficulty, and one of the elements of difficulty was that the case decided by the House of Lords hardly governed this case as far as related to the comparison between the particular rates there charged and the rates charged to the defendants. In the Denaby case the different members of the group of collieries—the charges to which were all equal, although the distance varied—were upon the same system of railway. Here it was different, because until the goods reached the Cudworth depot they did not come upon the Hull & Barnsley system. Therefore if the alleged inequality was permissible, it was not because the prohibition, which it was important to consider in the Denaby Main case, applied here; if the plaintiffs were relieved from the section of the Act it must be on a different ground, and because the goods were not carried under the same circumstances. He had to ask himself a question, which was one of very wide application, and that was whether through traffic which might come from a very great distance, and which ultimately passed over a portion of a particular line, could be considered to be traffic carried under the same circumstances as traffic carried only from the junction of two systems? He did not think it could. To hold that it could would be to strike a blow at the traffic arrangements which prevailed all over the kingdom. He supposed that there was scarcely an instance in the country in which goods came any considerable distance over system *A* and joined system *B* for a comparatively short distance, and in which the portion of the through rate allotted to system *B* was comparable in amount in relation to the persons whose premises were situated upon the latter system, and who used only that system. It was impossible that the traffic of the country could be carried on on the present basis unless the comparison were rejected. It was tried over and over again in the early days of the railway controversy to force the companies to charge on the same scale mile for mile in respect of goods of the same class, but it has always failed. The courts had always rejected the principle, seeing, no doubt, that to accept it would involve questions of commercial policy and general trade economies of the most difficult and important description, which it seemed to him could only be dealt with by express legislation, and could not be worked out by judge-made law. If it had been decided, as in the case of the Denaby Main Company, that the portion would not apply in respect of group rates on the same railway system it would certainly seem to be an unfortunate conclusion to be driven to that because a small section of the line happened to be on a different system a different principle should prevail. Although it might be that, looking to the language of the Act of Parliament, one might be driven to that conclusion, it was a conclusion that one ought to be slow to come to. But he felt even still more strongly that it would be almost preposterous to claim that a through rate for goods which came from a very considerable distance should be treated, in respect of the charges, on a par with the rate on a route which was entirely on a portion of the system used by the company which established the through rate. On these grounds his judgment must be for the plaintiffs, with costs.

The Paris Metropolitan Railroad.

We are indebted to *Engineering* for the accompanying map, which shows the mixed system of elevated, surface and tunnel lines for accommodating the local traffic of Paris, which after many years of delay has at last passed from the preliminary to a more practical phase.

The works are to be carried out under the auspices and control of the general government, and the purpose in view is not simply to serve purely local needs, but to form a complete junction system between the different lines extending to all parts of France, which is particularly needed at Paris, as all the railroad terminals except that of the line from Havre are at inconvenient distances from the city.

The plan will be seen to include:

1. An inner circle, with junctions to the various terminal stations.

2. A north-and-south transverse line in tunnel, connecting the Northern and Eastern railroad stations with a central station at the Halles and a subway passing beneath the two arms of the Seine and the Cité.

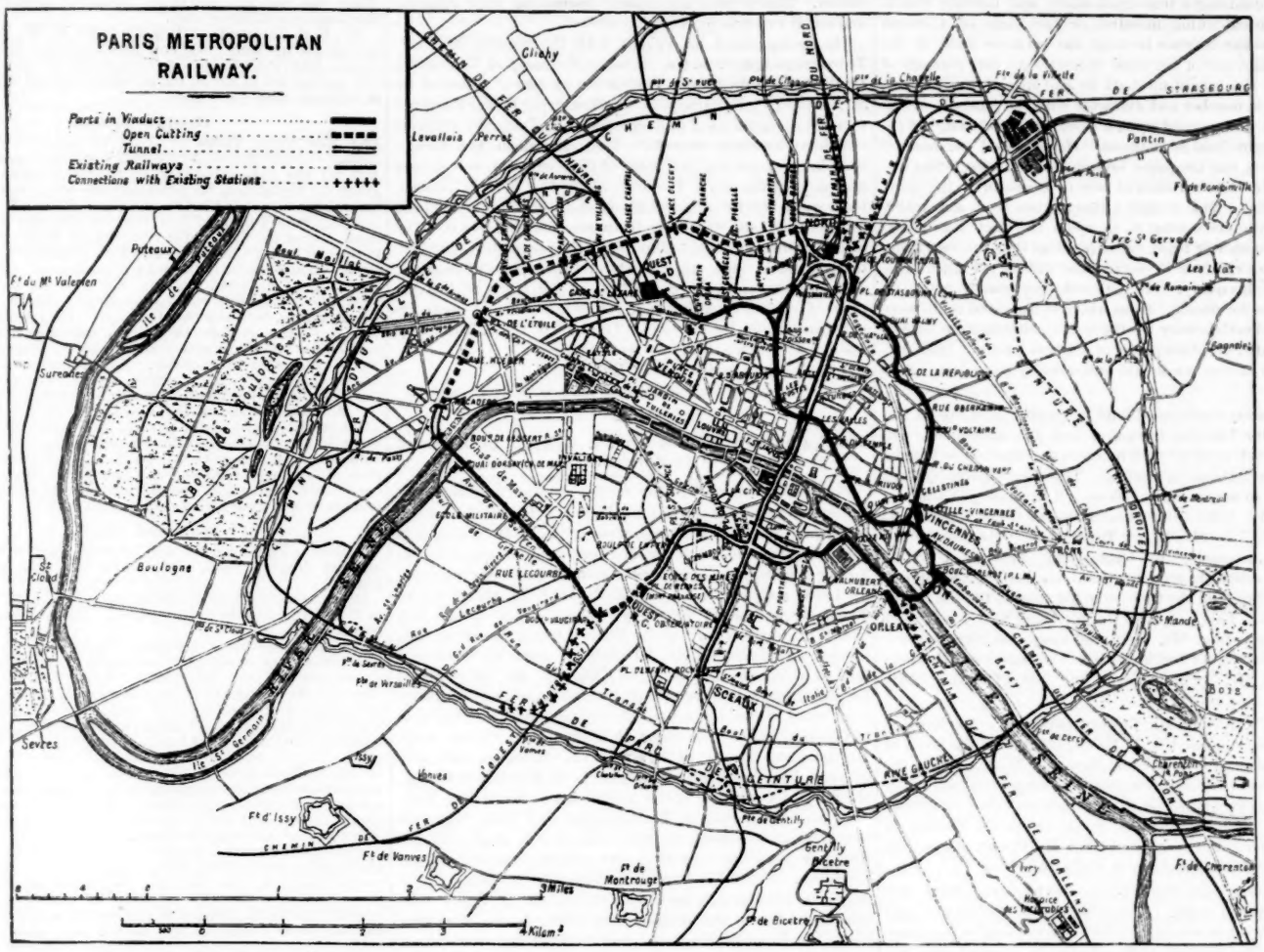
3. A line running obliquely from the St Lazare station to Vincennes, with a branch to the Northern station. This part, however, except between the two northerly stations, will be postponed until the completion of the rest.

The proposed stations, or most of them, are shown by cross-lines on the plan. They are rarely more than half a mile apart, although they do not seem to be as close as on parts of the New York elevated lines, which are often less than ¼ mile apart.

As regards the level of the railroad in relation to that of the ground, there will be seen to be much variation. On a total length of 20½ miles (33 kilos.) 9.3 miles will be on viaduct, 3.1 miles in open cutting, and 8.1 miles in covered way. There will be 64 stations, 28 on the viaduct, 15 in open cutting, and 21 in covered way. The viaduct portion of the line will be practically a type borrowed from a very complete project for an overhead railway system prepared by Mr. Haag, Engineer-in-Chief des Ponts et Chaussées. The structure will involve the appropriation of a considerable part of the public way along the route, and the destruction of considerable house property to form a new road, along the centre of which the railroad will run.

The estimated cost of the viaduct is $47,750,000, or nearly $5,134,400 per mile, which large sum is due to the large expenses connected with the expropriation of property, and the purchase and resale of the lands, the extent of which cannot be exactly estimated. The short stretch excepted, which it has been stated would be postponed till the completion of the rest of the system, the total cost of the sections of line in the tunnels or open cuttings is estimated to be $45,750,000, so that the complete work, apart from the Drouot-Vincennes section, mounts up to $92,500,000.

It is proposed to raise this large sum by giving a concession for 98 years to the governor of the Crédit Foncier of France, who engages to form a company with a capital of $10,000,000 within 30 days, the remainder to be subscribed by the public. Each railroad line, it is proposed, shall build its own connection with the metropolitan, enjoying running powers over the latter and guaranteeing a minimum traffic of $1,000,000 per annum for 20 years, until the postponed section is finished, and $1,400,000 per year thereafter. A guaranteed loan of $13,700,000 would likewise be placed, and the state guarantee interest on the remaining $44,750,000. In reality, the state would be responsible for the 4 per cent. interest on the share capital and the 4.25 per cent. on debentures; but this responsibility would be rendered insignificant by the co-operation of the great French railroad companies.



The proposed administration is under a director-general nominated by the state. Of the 12 directors, two would be nominated by the state, eight by the shareholders and two by the Municipal Council. It is contemplated also that the state should control the tariffs, with power to reduce them should dividends of over 6 per cent. be declared for two consecutive years.

In case the net revenue should be in excess of the sum necessary for guaranteeing shares and debentures, the balance above 6 per cent. would, at the discretion of the state, be divided equally between itself and the company, or applied to the extension of the system. Although nothing is said in the scheme on the subject of passenger rates, it appears probable that there will be a uniform price charged independent of distance and amounting to 5 cents first-class; 2 cents second-class, and 1 cent third-class. If so, the rates will certainly be very low. Such are some of the principal features of this great undertaking, which it appears probable will soon be carried into execution.

Contributions.

Chicago Meeting of the American Society of Mechanical Engineers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

There is nothing small about Chicago. The city is laid out on a large scale, say 20 miles on a side, the buildings are immense, its fire was the largest, its hospitality is unbounded, its riots are extensive; even our hotel had to be the GRAND Pacific.

Believing, as all Chicagoans do, that the heartiest welcome to a guest is to give him plenty to eat and drink, the committee had projected two meals for the entertainment of their visitors, but previous to the first one was the opening ceremony. The address of welcome was of the standard type; everything in the Mechanical Engineers is according to standard. Mr. J. A. Roche, of the Committee of Arrangements, told us what a nice lot of men we were, and did it in such a way as to make the younger members blush. The older ones have gotten to believe it themselves. Mr. Roche also told us how glad they all were to see us, and then became facetious and said several very clever things, but unfortunately the writer lost his notes of them and is afraid to draw on his imagination for a substitute. Mr. Towne, the Vice-President, responded happily and reversed the telescope, so that we appeared small and the Chicagoans large, and did it well, as he always does everything.

It had been decided by the Publication Committee that a series of topical discussions be instituted at this meeting to draw out information from those whose time, or inclinations, or modesty would not permit them to contribute a regular paper. These topics proved most interesting and the first one was: "Are there any grave objections to cam motions for moving the valves of high-speed engines? What is the limiting speed for cams?" This was discussed by Mr. Sinclair, who thought at the present day it was rather a difficult question to say what was a high-speed engine. Mr. Hemenway also spoke, stating he had used cams on a 10-in. cylinder engine making 240 revolutions, with excellent results as to wear and tear. Mr. Babcock had used cams on a slow-speed engine, but thought the fitting had much to do with any results.

The second topic, as to the maximum safe load for steel tires on steel rails, was discussed by Mr. Towne, who cited experiments made by Mr. Chanute on the Erie, from which 12,000 lbs. per wheel had been the maximum prudent load, as he deduced it. This view was opposed by Mr. Sinclair, who declared these figures would result in injury to the rails and tires, since slipping did more injury than a heavier load which would prevent it.

The third topic was an inquiry as to the present status of the question of smoke-preventing furnaces under boilers, as to which little was said. To the next question: "How do you make successful foundations for structures on yielding earth?" Mr. Jenney, a well-known architect, told how he had done it, and in the very building where we were sitting. Mr. Jenney's remarks were rather of a re-assuring character, and his history of the various methods for putting heavy weights on quicksands and clay was extremely interesting. He described the strata of the city as being clay for 3 ft. and then it was about the consistency of soap. On being asked how far it extended, he thought nearly to China; but this cannot be, for Mr. Metcalf stated at Pittsburgh to the Mining Engineers that the interior of the earth was filled with natural gas, and we believed him, or at any rate applauded him, which passes for belief in many cases. Mr. Jenney's method in general was to lay beds of concrete and to separate them into sections by 2-in. plank, so that each pier rested on an independent foundation, and to so tie the various beams together that if one pier settled differently from another, the ties would hold up the settled part and produce a uniform subsidence. Mr. Jenney stated the maximum weight permissible there, he thought to be two tons per square foot.

The next day the engineers assembled in the Methodist Church, not for service, but to hear papers read and discussed. It is an open question whether so many engineers could have been assembled there had a service been the attraction. It is to be feared that, overworked as they are, they interpret the day of rest in its most literal signification. First in order came the reports of committees. This might almost be stereotyped; they always report progress and ask for further time, and it is always granted. In this case both committees, the one on the appointment of a United States Test Commission and the other on Standard Pipe Threads, added to the usual report a statement that they expected to bring both matters to a successful issue, but wisely forbore to fix a more definite period than "shortly."

The first paper was "The Transmission of Power by Belting made by Messrs. Wm. Sellers & Co." and was presented by Mr. Wilfred Lewis. It will be remembered that Mr. Lewis presented a most able paper at the last meeting on "Transmission of Power by Gearing," giving a series of experiments made by him under direction of this same firm, which paper was one of the most practical and useful presented to the meeting. The present one was fully equal in interest to its predecessor and was exceedingly well received by the members.

Mr. Lewis stated that the apparatus employed had been arranged so as to discover what was the actual state of things, existing between belts and pulleys in ordinary practice. He therefore, directed special attention to the method of measuring the tension upon each side of the belt while working, as well as to the slip counter, which made it possible to multiply the observations with great rapidity and precision. In considering the effect of surface upon adhesion, Mr. Lewis did not consider atmospheric pressure an important element. In the case of vertical belts he showed clearly that the sum of the tensions increases with an increasing load; hence the theory usually accepted that it remains constant is erroneous. Especially was this true in horizontal belts, where the working tension is frequently three or four times that of the initial. He concluded that the co-efficient of friction may vary under practical working conditions from 25 to 100 per cent., and that its value depends upon the nature and condition of the leather, the velocity of sliding, the temperature and the pressure.

He also decided when the slip exceeds a certain amount its tendency to increase becomes greater, and that when the slip exceeds 20 per cent. a belt usually leaves the pulley. He also found the co-efficients in general use rather below than above the average results obtained, and that the economy of belt transmission depended principally upon journal friction and slip. Hence he considered it important to make belt speed as high as possible, up to 5,000 to 6,000 ft. per minute. He believed that all quarter twist belts should be avoided, and intermediate guide pulleys used in their place, so fixed that the belt may be run in either direction.

In the discussion which followed many things were instanced, such as the centrifugal force at high speed, and it further appeared that leather was not considered the best material for belting small spindles at very high speeds. It is very difficult to give in brief a fair idea of this admirable paper, but all speakers urged the need of a large fund to carry out further experiments, instead of leaving them to the liberality of one firm, although it is evident that Messrs. Sellers & Co. are fully able and willing to conduct them, and to give engineers the benefit of their labors.

The next paper, on "The Relative Efficiency of Centrifugal and Reciprocating Pump," was by W. O. Webber, of Lawrence, Mass. He cited the tests on the Leavitt engine, at Lawrence. In the experiments undertaken the highest efficiency obtained was 0.9164 for a lift of 170 ft., and pumping 3,615 gallons per minute. For greater lifts than 170, the curve of efficiency falls, and at 300 to 400 ft. is about .84 per cent.; below 170 it also falls reversely, and at 90 ft. it falls quite rapidly, while at 35 ft. 0.727 is the best record.

In regard to centrifugal pumps, the lift at which the maximum efficiency was obtained was about 17 ft. At from 12 to 18 ft. some claim to get 65 to 70 per cent. of the useful effect; 0.613 is the best done at 14.7 head. The experiments showed that the efficiency rises gradually and uniformly till the velocity becomes 11½ ft. per second. In general, it was stated, the efficiency of a centrifugal pump increases with its size, thus: 2 in. gave about 38 per cent., a 3 in. 45 per cent., 4 in. 52 per cent., 5 in. 60 per cent., and 6 in. 64 per cent., these dimensions referring to the diameter of the discharge outlet.

Mr. Horace Lee, of Philadelphia, then read a paper on "The Production of True Crank-Shafts and Bearings." The

method of obtaining a true crank-shaft and bearing was to use a cylindrical truing mandrel or face-plate of a length greater than the distance between the extreme ends of the main bearings, and of the same diameter as the journals of the shafts. For a built up shaft he had special bearings corresponding in number and diameter with the journals of the crank-shaft, and secured upon a stout and level bed, but capable of longitudinal adjustment. He described the method of application, and the paper brought out an interesting discussion. Mr. Babcock showed how to ascertain if the shaft was out of line. This evoked a conundrum from a member, who wanted to know what to do when the fact was ascertained. The answer being rather evident that the best thing to do was to straighten it, our member did not get much satisfaction from his query. Mr. Babcock then read a paper on "Substitutes for Steam," from which it appeared there were none deemed satisfactory by the writer, although one gentleman advocated the bisulphide of carbon motor. Had Mr. Keeley been present we should undoubtedly have heard of a substitute.

The afternoon commenced with "Another New Steam Engine Indicator," by Mr. Barnaby, and the instrument was handed around, meeting with more success than those handed around at the Pittsburgh meeting. This was followed by three papers read in succession as follows: "Inventory Valuation of Machinery Plant," by Oberlin Smith; "The Engineer as an Economist," by Mr. Henry Towne, and "The Shop Order System of Accounts," by Capt. Henry Metcalfe, U. S. A. As these all related to economic methods they were all discussed at once, and the time occupied showed the interest of the members. This is natural, for anything which will save is always interesting. Mr. West read a paper on "Irregularity in the Contraction of Duplicate Iron Castings," and the Secretary read Mr. Coggin's paper on "Novel Chimney Staying."

Following this came Mr. Crane's paper on "Purification of Water for Domestic Use." He ought to know the needs of this purification, for he lives in Newark, N. J., where the water is so bad that the brewers are making fortunes. Next came Mr. Taylor's paper on the "Relative Value of Water Gas and Gas from the Siemens Producer for the Melting in the Open Hearth Furnace," and lastly Mr. Cooper closed with a paper on "Grain Handling in California."

In the evening came the banquet, and like everything else, it was on a grand scale. The toasts were well chosen, and the wit and wisdom scintillated like sparks from a Bessemer converter. The speakers were admirably selected, and the one who replied to the toast of "Wind" proved by his remarks the fitness of his selection. The speech of our worthy Secretary rather excelled in wit any previous efforts on his part, and was thoroughly enjoyed.

The next morning we went to Armour & Co.'s packing houses. Just here a Chicago gentleman expressed to me a rather natural burst of indignation. He states that no sooner does the high-born Briton, "Lord Tomnoddy," or some other titled personage, arrive in Chicago than they are "on pins and needles" until they have been to this establishment, and then, having minutely inspected it in all its terrible details, they ignore all the very many wonderful and beautiful things to be seen in this magnificent city, and go home and characterize Chicago as one vast butchering place for "sticking pigs, 'don'tcher know.'" The process of hog-killing as practiced at Armour's is really in spite of its necessary attendant horrors, wonderful, as showing what a systematic appliance of labor and mechanism can do. It seems not inappropriate to glance at the methods, for mechanical appliances certainly play an important part. The hogs being in a small pen, are caught around the leg by a shackle fastened to a chain, which, winding up on a drum, hoists the pig into the air, head down. Before he can get out a respectable squeal he has been rapidly passed forward on a runway, and the butcher makes a quick stroke with his stiletto and gives it a sharp turn. The hog then passes along and is plunged into a caldron of boiling water, along which he floats to the opposite end, where he runs on to a table and passes between two rapidly revolving scrapers having sole-leather paddles, and from which he soon emerges shorn of all bristles. A chain is attached and he is hoisted again into the air, his hind legs being fastened apart by a stout stick, which is attached to a truck running on a track. As he moves rapidly off, a man splits him down the front and partly severs the head, and another removes the entrails; a man on the opposite side splits him down the back. He continues to travel dead-head over this narrow-gauge road, and at the terminus he is thrown on to a table, at either end of which stands a men with a sword or something like it, which he wields with both hands. A stroke decapitates him, and at the same instant the other man cuts him up. He is now only sides, hams, etc. The rapidity of this work it marvelous; with one butcher the rate is 25 hogs per minute, and when running full there are three butchers, so that 1,500 hogs per hour go through the mill. From statistics it appears that Armour & Co. killed last year 1,133,479 hogs, 330,652 cattle and 63,262 sheep. Several of the ladies went through the place and wished they had not. From here the party visited Pullman, but that is so familiar to your readers that description is unnecessary. On the return we stopped at the South Chicago Rolling Mills and were very much surprised at their extent and the completeness of their plant. The mechanical appliances were of the very highest type, and the location of these mills is such that they have every advantage of water and rail communication, not alone with their markets, but also with the Lake Superior iron mines. Large propellers were being rapidly discharged by means of steam derricks, and the ore was being stocked up in bins, as all shipments from the mines must be made during the summer season. That evening the topical discussions were resumed and much valuable information elicited.

The session closed on Friday with the reading of Prof. Trowbridge's paper on the "Relative Economy of Ventilation by Heated Chimneys and Ventilation by Fans," followed by Mr. Giddings' "Dynamometer for Measuring Power Required to move Slide-valves;" and concluded by Prof. Woodward's "Manual Training Schools." That afternoon the society went in carriages and saw some of the beautiful drives and fine parks of the city. The drive along the lake in Lincoln Park was a treat to all, and the view of this immense inland sea charmed all who were fortunate enough to see it. The members then separated, filled with the pleasantest recollections of their visit, their hosts, and their place of meeting. Although Chicago has frequently been the place of conventions of various organizations, yet their hospitality seems inexhaustible; like the adviser of "Koko" in the Mikado, they always do the two things he recommended:

"Don't stint yourself" and "Do it well."

ONE OF THOSE WHO WAS DONE WELL.

The Late G. A. Nicolls—Half a Century of Railroad Service.

Gustavus Anthony Nicolls, a civil engineer, president of the lateral railroads of the Philadelphia & Reading Railroad Company, died May 18, 1886, of paralysis, at his residence in Reading, Pa. He was descended from the ancestors of Sir Jasper Nicolls, late Governor-General of India, dating back to 1580, and was born April 3, 1817, at Abbey View, Thomastown, County Kilkenny, Ireland. His father was Col. Wm. Darm Nicolls, of the English Royal Artillery. His mother was Maria Graves, daughter of Anthony Graves, a land proprietor in the County of Kilkenny. He was educated for the military profession, but decided to seek his fortune in the United States, for which country he sailed from England in October, 1834. He came to Philadelphia to his uncle, Bartholomew Graves, at the age of 17. In April, 1835, as a rodman, he entered the engineer corps of Moncure Robinson, the first chief engineer of the Philadelphia & Reading Railroad (now a resident of Philadelphia), and from that time to the day of his death he remained in the employ of the company in various capacities. In 1836 he became Assistant Engineer. In 1837 he was made Principal Assistant Engineer. In 1838 he was made Superintendent of Transportation, and retained that position until 1846. In the latter year he was made Chief Engineer and General Superintendent, which positions he filled for 13 years. In 1859 the offices were separated, and Mr. Nicolls chose the general superintendency, filling that office for 13 years also. In 1871 he was made General Superintendent and President's Assistant by F. B. Gowen, then President. From 1871 to 1877 he lived in Philadelphia. In 1873 he was elected Second Vice-President, and re-elected in 1874, '75 and '76. In 1877 he was elected President of the lateral roads, and in 1876 was made President of the Susquehanna & Tide-Water Canal, retaining the positions until his death.

In the discharge of the duties of all these important offices Mr. Nicolls was ever prompt, active and energetic. During his term of service, under 10 presidents of the company, covering 51 years, he saw his company grow with the country, from the time when it ran but one daily passenger train to Philadelphia until the present day, when it has 10 or 12 passenger trains each way daily, an income of many millions, and is the greatest coal-carrying railroad in the world.

Mr. Nicolls took an active part in many of the industrial enterprises and charitable institutions of Reading. During the late war he was active in the support of the government, and liberally gave to it his money, influence and labor. He had traveled considerably in this country, and made several trips to Europe.

Mr. Nicolls married, in 1846, Rosa Catherine Muhlenberg, only daughter of the late Hon. Henry A. Muhlenberg, Member of Congress and Minister to Austria. She died in 1867. In 1869 he married Annie Hall Muhlenberg, daughter of the late Dr. F. A. Muhlenberg, of Lancaster. She, with one son, Frederick Wm. Nicolls, survives him.

The motto of the Nicolls family, *fide et industria* (by fidelity and industry), has been well illustrated during his life. His funeral took place May 22 at Reading, and was largely attended by all classes of citizens, by four chief engineers, two of whom are still in the service of the company, and by the leading officials, officers and employés of the Reading Railroad.

R. B. O.

PHILADELPHIA, June 7, 1886.

TECHNICAL.

Locomotive Building.

At the annual meeting of the New York Locomotive Works in Rome, N. Y., last week, the following directors were chosen: Edward Comstock, H. M. Lawton, F. G. Nock, W. W. Wardwell, Rome, N. Y.; Wm. A. Burr, Cazenovia, N. Y.; John W. Ellis, Wm. B. Isham, H. A. V. Post, Frederick Robert, New York.

The Dickson Manufacturing Co. in Scranton, Pa., has several orders for heavy locomotives on hand.

The Car Shops.

The Wagner car door is to be put on 1,000 new cars shortly to be built for the Pennsylvania lines west of Pittsburgh. This door has been adopted by the Atchison, Topeka & Santa Fe Co. for its cars. It is stated that shippers of flour in sacks now frequently specify cars with the Wagner door in giving orders for car-load shipments, appreciating the protection afforded by this device.

The Indianapolis Car Works have begun work on an order for 300 box cars for the Terre Haute & Indianapolis road.

The Harrisburg Car Manufacturing Co. in Harrisburg, Pa., has started up its shops on an order for 500 box cars for the Pittsburgh & Western road.

The Wason Manufacturing Co. at Brightwood (Springfield), Mass., has just delivered three handsome passenger cars to the Connecticut River road.

Mr. E. S. Bushnell, of Poughkeepsie, N. Y., is furnishing springs for the seats of 50 new passenger cars now being built for the New York Central & Hudson River road. The Bushnell springs are in use on the passenger cars of the Delaware & Hudson Canal Co.'s lines.

Bridge Notes.

The New York *Times* of June 11 says: "The Harlem Bridge Commissioners determined yesterday morning to reject all the bids submitted to them. Several reasons are given for this action, the principal one being that John McQuade, the lowest bidder for the masonry work on the new bridge, found it impossible to combine with the lowest or, indeed, any of the bidders for the erection of the metallic portions, and as the Commissioners decided at the first that the bridge should not be built under a number of contracts terminating at different periods, but that all the contractors should be held jointly responsible for the due completion of the structure, they rejected the bids. They were induced to take this course because they think that the bridge can be erected for much less now than last April, when the bids rejected yesterday were made. At that time material was dearer than at present, the labor market was unsettled, and the eight-hour movement hung threateningly on the horizon.

"McQuade's bid for the masonry work was $1,093,000. The lowest bidder and the most of the other bidders on the metallic work considered this amount dangerously low, and refused to accept with McQuade a joint liability to complete the bridge within the time specified. Had the bridge been built under the several lowest bids submitted to the commission it would have cost $1,970,000."

Iron and Steel.

The Beaver Falls Iron Co. will shortly start up the rolling mill at Beaver Falls, Pa., which has been idle for two years.

Eight new open-hearth steel furnaces are now being built in Pittsburgh and the neighborhood. This will make the total number there 25.

Constant improvement seems to bear about the same relation to the economical and successful manufacture of Bessemer steel and rails that eternal vigilance is said to bear to liberty. No rail works in the country has had a higher appreciation of the necessity of such improvements than the Edgar Thomson Steel Works, but the Messrs. Carnegie not being satisfied with what has been accomplished, have given Capt. Jones *carte-blanche* to build an entirely new rail mill alongside of the present one, and to equip it with all of the latest improvements, including some of Capt. Jones' that have not yet been used at any works. When the new mill is completed, the old mill will be rebuilt, and held in reserve to make either rails or merchant steel as may be demanded. It is believed by the Messrs. Carnegie that not only will they be enabled in this new mill to increase the production and lessen the cost of product, but that the improvements adopted will be such as to materially improve its quality as well. The contract for the G furnace at this works has also been placed, making seven furnaces, and which will, when completed, make the Messrs. Carnegie the largest producers of pig iron in the world. The building of the two additional furnaces, F and G, was necessitated by their method of working: that is, direct. The output of the seven furnaces will be greater than their present converting capacity. This will permit a selection of iron for blowing, and not compel, as has been the case when the blast furnace capacity was about equal to that of the converting house, the sending to the converter of whatever iron may be produced. Out of all of the furnaces plenty of iron of the right chemical composition will be produced for the converters.—*American Manufacturer.*

Hunnewell Furnace, in the Hanging Rock region in Kentucky, went into blast last week.

Blast Furnaces of the United States.

The *American Manufacturer* (Pittsburgh) says: "Our monthly statement gives in detail by districts and fuels used the number of furnaces in and out of blast on June 1, and the weekly capacity of the same.

"Regarding these capacities it should be noted that they are in most instances capacities, and are slightly in excess of the actual make, though not in excess of the production that has sometimes been reached by the furnaces. In other cases, however, the capacity given is the actual average production of the furnaces. It is also to be noted that since Jan. 1, when there has been a great increase in the number of anthracite and bituminous furnaces in blast, there has also been considerable increase in the average capacity of the furnaces in blast. Furnaces blown in during that time have increased their make, and old furnaces, by adopting new practices, have also somewhat increased their production.

"In a condensed form, the table makes the following showing:

	In blast.		Out of blast.	
Fuel.	No.	Weekly capacity.	No	Weekly capacity.
Charcoal	54	9,884	161	16,795
Anthracite	123	35,136	87	18,909
Bituminous	131	74,750	90	33,412
Total	308	119,770	338	69,117

"A comparison of this table with that giving the condition of furnaces last month shows that there has been an increase in the number of furnaces in blast in each of the three divisions. The charcoal furnaces in blast have, during the month, increased from 47 to 54; there has been an increase of one in the number of anthracite furnaces blowing, and an increase of four in the number of bituminous. The weekly capacity of the furnaces in blast has also increased during the month in round numbers 9,500 tons, making the present weekly capacity of the furnaces in blast nearly 120,000 tons. Never before in the history of the country has there been so large a capacity of the furnaces blowing.

"Since Jan. 1 the increase in furnaces in blast and in their weekly capacity, as intimated above, has been most marked. The statement for the two dates named is as follows:

	Jan. 1, 1886.		June 1, 1886.	
Fuel.	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	57	7,804	54	9,884
Anthracite	104	29,811	123	35,136
Bituminous	112	59,436	131	74,750
Total	273	97,051	308	119,770

"While the number of charcoal furnaces in blast was three less on June 1 than on Jan. 1, the capacity is 2,000 tons a week greater. This comes from the blowing in of some new charcoal furnaces, and of remodeled old furnaces, these new furnaces having greater capacity than the ordinary charcoal furnaces, or than those which they have displaced. There has been an increase since Jan. 1 of 19 in the number of anthracite furnaces in blast, and an increase in capacity of those in blast of 6,325 tons. The increase in the number of bituminous furnaces in blast is precisely the same as the increase in anthracite, viz., 19, but the increase in capacity is much greater than the increase of the anthracite capacity, being 15,314 tons per week as compared with 6,325 tons of anthracite. It is to be noted, however, that all of this increase is not to be ascribed to the furnaces that have been blown in since Jan. 1, a portion of it being

due to the increase in capacity of those that were in blast on the first of the year.

"Our returns do not give us the necessary data to render a complete statement as to the stocks, but the partial information that we have received up to this date would show that they are increasing rapidly in per cent, though at the present time they are by no means as great as they have been at certain periods in the past. The important feature in the increase is that its percentage is large, though this percentage, of course, is on a small previous stock. * * *

"Comparing the presentmonth with the corresponding period a year ago, there were 44 more anthracite stacks in operation than on June 1, 1885, with an increase in weekly capacity of 15,302 tons. As the capacity of the anthracite furnaces in blast a year ago was only 19,834 tons, the increase is equal to nearly 80 per cent. The increase in the number of bituminous stacks in blast during the year has been 40; the increase in capacity in blast is 36,595 tons, or about 75 per cent."

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

	Page.		Page.
Atchison, Top. & Santa Fe	292	Manchester & Lawrence	414
B. & O. Employes' Relief As'n	345	Marquette, Houghton & Ont	414
Baltimore & Philadelphia	15	Michigan Central	23, 343
Boston & Lowell	15	Mil., Lake Shore & Western	191
Boston & Maine	23	Mississippi & Tennessee	120
Boston & Providence	15	Missouri, Kansas & Texas	367
Buffalo, N. Y. & Philadelphia	16	Missouri Pacific	366
Canadian Gov't Railroads	272	Nashua & Lowell	414
Canadian Pacific	393	Natchez, Jackson & Col	104
Carolina Central	366	Naugatuck	26
Charlotte, Col. & Augusta	155	New Haven & Northampton	306
Chartiers	394	New London Northern	120
Chesapeake & Dela. Canal	414	N. Y. & New England	16
Chesapeake & Ohio	240	N. Y., N. Haven & Hartford	23
Cheshire	104	N. Y., Ontario & Western	86
Chicago & Alton	156	N. Y., Providence & Boston	25
Chi., Burlington & Quincy	292, 308	N. Y. Railroad Commission	33
Chi. & Grand Trunk	324	N. Y., Susquehanna & Wes'rn	139
Chi., Milwaukee & St. P	208, 224	N. Y., West Shore & Buffalo	58
Chi. & Northwestern	414	Norfolk & Western	104
Chi., Rock Island & Pacific	393	Northern Central	156
Chi., St. P., Minn. & Omaha	256	Norwich & Worcester	120
Chi, St. L. & Pittsburgh	324	Northeastern (South Carolina)	16
Cin. & Muskingum Valley	394	Northern (New Hampshire)	414
Cin., Orleans & Tex. Pacific	140	Ohio & Mississippi	174
Cin. & Springfield	208	Panama	307
Cleveland & Canton	192	Pennsylvania & New York	224
Cleve., Col., Cin. & Ind	208	Pennsylvania Railroad	175
Columbia & Greenville	174	Peoria, Decatur & Evansville	192
Col., Hocking Vy. & Tol.	192, 360	Philadelphia & Reading	48
Concord	367	Phila., Wil. & Baltimore	307
Connecticut River	85	Pittsburgh, Cin. & St. L	394
Consolidation Coal Co	139	Pittsburgh & Lake Erie	68
Cumberland Valley	307	Pittsburgh Junction	95
Del. & Hudson Canal Co	256	Pitts., McK. & Youghiogheny	68
Del., Lacka. & Western	104, 156	Pitts., Wheeling & Ky	394
Denver & Rio Grande	139	Portland & Ogdensburg	120
Des Moines & Fort Dodge	291	Providence & Worcester	120
Detroit, Lansing & No	323	Richmond & Alleghany	86
Detroit, Gd. Haven & Mil	324	Richmond & Danville	85
Dublin & Wrightsville	255	Richmond, Fred. & Potomac	86
Fitchburg	68	Rochester & Pittsburgh	86
Fort Wayne, Cin. & Louisv	307	Rome, Wat. & Ogdensburg	85
Galveston, Houston & Hen	367	St. L, Iron Mt. & So	367
Georgia Pacific	272	St. L. & San Francisco	192, 343, 360
Grand Trunk	324	St. L., Van. & Terre Haute	292
Hanover June, Han. & Gett'g	414	St. Paul & Duluth	155
Housatonic	192	Savannah, Fla. & Western	344
Houston & Texas Central	272	South Carolina	208, 308
Huntingdon & Broad Top Mt	120	Stewartstown	393
Illinois Central	174	Troy & Greenfield	223
Indianapolis & St. Louis	208	Union Pacific	239
International & Gt. No	367	Utica & Black River	272
Kansas City Union Depot Co	256	Virginia Midland	139
Lake Shore & Mich. So	23, 323, 314	Western Maryland	139
Lehigh Coal & Navigation Co	140	Western North Carolina	192
Lehigh Valley	68, 224	Wilmington, Col. & Augusta	104
Leh. & Wilkes-Barre Coal Co	139	Wilmington & Weldon	104
Little Miami	394	Worcester, Nashua & Roch	191
Louisville, N. Albany & Chi	255	Wrightsville & Tennille	256
Maine Central	68		

Chicago, Rock Island & Pacific.

The mileage operated by this company for its last fiscal year was 1,383.4 miles, the same as at the conclusion of the preceding year. There are 162.7 miles of second track and 286.1 miles of sidings. The report is for the year ending March 31.

A new branch to St. Joseph, Mo., 64.4 miles was built, but not brought into operation until near the close of the year, as noted below.

The equipment includes 331 locomotives; 141 passenger, 23 sleeping, 9 dining, 9 postal and 44 baggage, mail and express cars; 4,586 box, 1,237 stock, 1,783 flat and coal and 259 drovers' and caboose cars; 3 officers' and pay cars and 700 gravel, hand and other service cars.

The general balance sheet is as follows:

Liabilities.

Capital stock fixed $50,000,000, amount issued		$41,959,800
Fractional scrip oustanding, convertible into stock		200
		$41,960,000
Six per cent. mortgage coupon bonds	$5,340,000	
Six per cent. mortgage registered bonds	7,160,000	
Five per cent. extension coupon bonds	3,570,000	
Five per cent. extension registered bonds	390,000	
		16,460,000
Chicago & Southwestern bonds, guaranteed		5,000,000
Addition and improvement account		7,213,000
Accounts payable		506,751
Profit balance of income account		544,523
Total liabilities		$72,684,274

Assets.

Cost of road and equipment, including all branch roads owned by this company	$50,607,710
Cost of railroad bridge at Rock Island	758,526
Capital stock and bonds of connecting roads	8,382,029
Loans and other investments	1,451,387
Six per cent. C., R. I. & P. Ry. mortgage bonds on hand	400,000
Stock of materials, fuel, etc., on hand	356,281
Accounts receivable	860,944
Cash and loans (payable on demand)	867,397
Total assets	$72,684,274

The funded debt was increased by $960,000 extension bonds issued for the new St. Joseph Branch, as stated below. The report says: "The proceeds of the sale of $1,470,000 of the 5 per cent. extension bonds have been invested in stock and bonds of connecting and other railroads, for the protection of this company's interest."

The earnings for the year were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Freight	$7,713,659	$8,144,142	D. $430,483	5.3
Passengers	3,127,258	3,023,884	I. 103,374	3.4
Mail	186,806	191,090	D. 4,284	2.2
Express	148,670	147,423	I. 1,247	0.8
Rents, interest, etc	611,027	497,550	I. 113,477	22.8
Car mileage	208,821	190,067	I. 18,754	9.9
Telegraph	8,107	8,755	D. 648	7.2
Total	$12,004,348	$12,206,911	D. $202,563	1.7
Expenses	7,166,893	7,160,324	D. 6,569	0.9
Net earnings	$4,837,435	$5,046,587	D. $209,132	4.1
Gross earn. per mile	8,677	8,824	D. 147	1.7
Net " "	3,497	3,647	D. 150	4.1
Per cent. of expenses	59.7	58.7	I. 1 0	....

Expenses include taxes, which amounted to $391,871 last year, against $294,605 in the preceding year.

In comparison with the previous year passenger earnings show an increase of $103,373, or 3.42 per cent., which is made up of an increase in earnings on business from connecting lines of $18,775 and an increase of earnings from business originating on our own line of $84,597.

Freight earnings for the year show a decrease of $430,483, or 5.28 per cent. The revenue from through freight (freight delivered to or received from connecting lines) decreased $458,028, while the revenue from local freight increased $27,545. Of the entire freight earnings, 54.36 per cent. was from through, and 45.64 per cent. from local freight.

The increase in taxes was due to an alteration in the Iowa law changing the date of payment.

The result of the year was as follows:

Net earnings, as above		$4,837,455
Net cash receipts from land sold		310,000
Total		$5,147,455
Interest on bonded debt	$1,213,250	
Rental of leased lines	301,995	
Rental and tolls, Mo. River bridges	164,785	
Dividends on stock	2,037,186	
Carried to addition and improvement account	463,000	
		5,080,216
Balance, surplus for the year		$67,239

Four quarterly dividends of 1¾ per cent. each were paid, making 7 per cent. in all paid on the stock.

The traffic for the year was as follows:

	1885-86.	1884-85	Inc. or Dec.	P. c.
Passengers carried	3,121,607	2,849,900	I. 272,707	9.6
Passenger-miles	129,208,404	122,618,235	I. 6,590,169	5.4
Tons freight carried	3,873,605	3,980,502	D. 106,897	2.7
Ton-miles	719,972,565	780,944,261	D. 60,971,696	7.8
Average rate:				
Per passenger-mile	2.420 cts.	2.466 cts.	D. 0.046	1.9
Per ton-mile	1.070 "	1.040 "	I. 0.030	2.9

The average cost per unit of traffic (counting a passenger mile equal to a ton-mile) last year was 0.804 cent. The average passenger journey was 41 miles; the average freight haul 186 miles. The figures above do not include 406,381 tons of freight carried 41,876,807 miles for the use of the company.

The train mileage was as follows:

Train-miles:	1885-86.	1884-85.	Inc. or Dec.	P. c.
Passenger	2,485,655	2,479,343	I. 6,312	0.3
Freight	7,158,707	7,406,267	D. 247,560	3 3
Other	707,945	628,606	I. 79,339	12.3
Total	10,352,307	10,514,216	D. 161,909	1.5
Av. train load:				
Passengers, No.	52.0	49 0	I. 3.0	6 1
Freight, tons	106.4	106.3	I. 0.4	0.4

The earnings per passenger-train mile last year were $1.08; per freight-train mile, $1.26. The expenses per mile run, all trains, were $0.70. The cost of maintenance of way was 11.64 cents per mile run. The car mileage last year was: Passenger trains, 14,039,285; freight, 99,111,717; service, 3,323,704.

Mr. J. L. Drew, the Land Commissioner, presented the following report: The sales of land have amounted during the year to 2,469.99 acres, for the total sum of $25,466, or at an average price of $10.31 per acre. The bills receivable unpaid and on hand now amount to $676,114 (principal). The receipts for interest have been $57,243. Taxes paid, as of Nov. 1, 1885, on lands, etc., then unsold, were $3,941, being on 17,313 acres of land, and on unsold property in the town of Audubon. Besides, the sum of $786 has been expended on back taxes on lands which the company has had to take back, owing to defaults in payment. The remittances to the treasurer of the company, from the receipts of this office, have amounted to $310,000. The acreage on the books of land unsold on April 1, as to which the title is considered perfect, is 16,749. The past year has been exceedingly unfavorable for the sale of lands in Western Iowa, at reasonable prices. The low figures obtainable for farm produce and the emigration of many embarrassed farmers to newer settlements have caused a very considerable quantity of lands, improved or partially so, to be thrown upon the market, and at prices much less than could readily have been realized but a short time ago; and until such offerings be absorbed by new settlers or investors a lively demand is not to be expected. Fortunately this company had disposed of all but a small portion of its lands before this temporary reaction set in; and, as nearly all the land sold by it was actually occupied and improved by the purchasers, and is, therefore, still much more valuable than the lien for remaining purchase money unpaid, our collections have continued to be very fair, and the acreage the company has had, or will have, to take back, will not reach to any very considerable figure.

The usual improvements are reported, the principal being several reductions of grades on the Iowa Division and 6 miles of new sidings. There were 3,349 tons steel rails and 389,407 new ties used in renewals. Eleven locomotives, 6 passenger cars, 32 box and 6 caboose cars were added to the equipment. Seven of the locomotives were to replace old ones worn out.

The report says: "Since the date of the last report a road has been built by the St. Joseph & Iowa Railroad Co., a corporation existing under the laws of the state of Missouri, from Altamont, Daviess County, Mo., a station on the Southwestern Division of this road, through Daviess, DeKalb and Buchanan counties to St. Joseph, Mo., a distance of 49.75 miles, with a branch from St. Joseph, Mo., to Rushville, Mo., a station on the Atchison Branch of this road, 14.66 miles. Total mileage, 64.41 miles.

"To aid in the construction of that line the Chicago, Rock Island & Pacific Railway Co. has issued $960,000 of its 5 per cent. extension and collateral bonds, being at the rate of $15,000 per mile for 64 miles of completed road. The proceeds of sale of these bonds have been used in building the line and obtaining station and terminal facilities at St. Joseph, Mo., which are now worth a very considerable advance over the cost to the company. As security for this investment the company has received from the St. Joseph & Iowa Railway Co. its entire issue ($960,000) of first-mortgage 6 per cent. bonds, and all the stock of that company. A traffic arrangement has also been entered into between the companies, which cannot fail to be mutually advantageous, and particularly so to the Chicago, Rock Island & Pacific Railway Co., as it gives it a direct entrance to St. Joseph (a city of about 35,000 inhabitants, and one of the most prosperous on the Missouri River), with passenger and freight depots, situated in the business centre of the city. The preliminary surveys for this line began May 24, 1885, grading was commenced Aug. 8, 1885, the track completed Jan. 8, 1886, and the road opened for business Feb. 1, 1886."

Alabama, New Orleans, Texas & Pacific Junction.

This company is an English organization which owns the Vicksburg, Shreveport & Pacific, 189 miles, and the New Orleans & Northeastern, 195 miles; also a controlling interest in the Vicksburg & Meridian, 142 miles and (jointly with Alabama Great Southern) a controlling interest in the Cincinnati, New Orleans & Texas Pacific Co., lessee of the Cincinnati Southern road, 336 miles. The Alabama Great Southern, 295 miles, controlled by the same owners, and is operated in connection with this company's lines. The report is for the year ending Dec. 31.

The report of the Cincinnati, New Orleans & Texas Pacific Co. has been already published. The Vicksburg & Meridian is in the hands of a receiver, who makes a separate report. The reports of the two other lines are given below.

A large amount is due this company from the controlled companies. It is proposed to settle this debt by issues of preferred bonds, as noted in the report.

NEW ORLEANS & NORTHEASTERN.

This road extends from Meridian, Miss., to New Orleans, 195 miles. It was first operated for its entire length in 1884.

The earnings for the year were as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings	$698,165	$597,446	I. $100,719	16.9
Expenses	596,224	672,634	D. 76,410	11.4
Net earnings	$101,941	*$75,188	I. $177,129	.....
Gross earn. per mile	3,580	3,064	I. 516	16.9
Net " "	523	.....	.....	.....
Per cent. of exps	85.4	110.9	D. 25.5	.....

* Deficit.

The report says: "The gross earnings of the road, while showing an increase for the year of nearly 17 per cent., have not equaled the expectations of the management. During the first nine months there was an increase of $145,270, but for the remaining three months the receipts decreased $44,551 in comparison with corresponding months of the preceding year, thus reducing the net increase to $100,719. During the last three months there was a falling off of $15,945 in the passenger traffic, as that period compared with a time when the passenger traffic was considerable, owing to the New Orleans Exposition. There was also a decrease in the freight traffic of $27,100, as well as a slight reduction in receipts from car mileage and engine hire. The loss in freight traffic was owing to cotton being shipped *via* Northern lines direct to the spinners, while in 1884 the larger portion sought the Gulf ports for shipment to Europe. During 1884 the cotton tonnage was 22.99 per cent. of the entire tonnage moved, while in 1885 it was 12.05 per cent., a comparative loss of nearly 11 per cent. and an actual loss of 67,000 bales in amount of cotton handled. * * *

"The necessary formalities in connection with the issue of prior lien bonds to the extent of $7,000 per mile, authorized last year, have been completed. A considerable portion of the bonds have been sold, and the rest will be issued as required.

"The amount due from this company to the Alabama, New Orleans, Texas & Pacific Junction Co. on Dec. 31, 1885, was £231,017, of which the amount due for unpaid interest and coupons of first-mortgage bonds was £222,566."

VICKSBURG, SHREVEPORT & PACIFIC.

This road extends from Delta, La., to the Texas line, 189 miles. The 19 miles from Shreveport to the Texas line are leased to the Texas & Pacific Co., leaving 170 miles worked. The figures given below are for six months to Dec. 31 only.

The earnings for the half-year were as follows:

	1885.	1884.	Inc or Dec.	P.c.
Earnings	$287,908	$233,510	I. $54,458	23.3
Expenses	201,795	181,054	I. 20,741	11 4
Net earnings	$86,173	$52,456	I. $33,717	64.2
Gross earn. per mile	1,694	1,374	I. 320	23.3
Net " "	507	309	I. 198	64.2
Per cent. of exps	70.1	77.5	D. 7.4	....

The report says: "The amount due from this company to the Alabama, New Orleans, Texas & Pacific Junction Co. is: Advances for construction, £64,565; for unpaid coupons on first-mortgage bonds, £202,981; total, £267,546.

"The Executive Committee are of opinion that this amount should be paid off in a manner similar to that suggested in the case of the New Orleans & Northeastern Co.

"An issue was recently made of $1,000,000 of the prior lien bonds of the Vicksburg, Shreveport & Pacific Co., authorized last year, and the bonds are now quoted on the London Stock Exchange."

Alabama Great Southern.

This company owns a line from Wauhatchie, Tenn., to Meridian, Miss., 290 miles, and the company has running powers over five miles of the Nashville, Chattanooga & St. Louis track between Wauhatchie and Chattanooga, making in all 295 miles. The securities are chiefly held in England, and the report for the year ending Dec. 31 last comes from London.

The passengers and freight carried were as follows:

	1885.	1884.	Decrease.	P. c.
Passengers	199,210	220,670	21,460	9.7
Tons freight	556,038	627,947	71,909	11.5

A considerable part of the freight is coal, pig iron and iron ore, which are necessarily carried at low rates.

The earnings for the year were as follows:

	1885.	1884.	Inc. or dec.	P.c.
Earnings	$1,076,188	$1,165,102	D. $88.914	7.6
Expenses	948,048	1,021,437	D. 73,389	7.2
Net earnings	$128.140	$143,665	D. $15,525	10.8
Gross earn. per mile	3,648	3,949	D. 301	7.6
Net " " "	43½	487	D. 53	10.8
Per cent. of expenses	88.1	87.7	I. 0.4	....

No statement of the disposition of net earnings is given.

The report says: "The depression which has so long existed in the United States, and which has continued beyond the close of 1885, materially affected the business of this company, as well as that of every line in the South. There was a decrease in tonnage and in the number of passengers carried. While there was an average gain of 18 cents per passenger, there was an average loss of 5 cents per ton of freight, which loss was in part attributable to the low competitive rates prevailing in the first three months of 1885, and in part to the low rates charged upon all shipments to and from the New Orleans Exposition. This loss of 5 cents per ton is equal to a loss of $27,800 net revenue. The working expenses, however, are abnormally high, and must be materially reduced if the shareholders are to obtain an adequate return on the capital expended. With regard to this important point the directors have received advices from the Executive Committee which indicate where a great saving may be effected. The Committee report that the cost of maintenance will be materially reduced if the remaining iron rails now in the track are replaced with steel. They recommend that at least 10,000 tons of steel rails be laid as soon as possible, and that arrangements be made for a further delivery of 500 tons per month, to commence in January, 1887, and to continue till the 198½ miles of iron rails are replaced. During the years 1883, 1884 and 1885, the sum expended on repairs to the track and roadway was $829,469, which is equal to 25 per cent. of the gross revenue earned during those years. With a steel track in good order, the expenditure on maintenance of way should not exceed 16 per cent. of the gross earnings, and a reduction to this extent would, in the three years above mentioned, have made a saving of about $100,000 per annum."

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

TRUNK LINE THROUGH FREIGHT MOVEMENT IN MAY.

The report of shipments of freight from Chicago in May, as in March and April, is incomplete, lacking the shipments made over the Chicago & Atlantic Railroad, which, being taken at less than the regular rates, have doubtless been a much larger proportion of the whole than usual. These shipments go either over the New York, Pennsylvania & Ohio to the Erie, or by the Wabash to Detroit and thence by the Grand Trunk, and those going by the latter route, which have been made for something like a year, never have been reported. It is quite possible that as much as 25 per cent. of the entire shipments, and possibly more, went by this road in May, and this accounts partly, no doubt, for the extraordinarily large part of the New York grain receipts brought to New York in May by the Erie and Lehigh Valley, the latter having a freight line running over the Wabash.

The reported Chicago shipments eastward of through freight of all kinds (except live stock and dressed meats) in May have been:

Year.	Tons.	Year.	Tons.
1879	280,355	1883	149,287
1880	127,523	1884	258,874
1881	171,431	1885	300,875
1882	118,350	1886	119,314

In 1879, 1884 and 1885 the rates were so low that there was no profit on these shipments. If we estimate the unreported freight as one-fourth of the whole, the total last May was about 160,000 tons, if one-fifth, it was about 150,000 tons, and this latter is as large a quantity as in any other May *when rates were maintained* except 1881. But the seven roads reporting doubtless carried less than in any other year except 1882, when one of them was not yet open. Thus so far as the traffic of the country is concerned, the Chicago shipments in May are very fair, but so far as the earnings by the Chicago railroads in the pool are concerned, they are somewhat less favorable than in any other year when rates were maintained. There can be no doubt, however, that their profits from the business are much larger than last year or the year before.

When the live-stock and dressed meat shipments are included, the increase in profits this year must have been important, for the shipments were as large this year as last, and the margin of profit probably ten times as great, if there was any margin of profit last year, which is very doubtful. These shipments were 70,000 tons in May, including the Chicago & Atlantic as well as the other roads, which, we see, is equal to nearly three-fifths of the reported shipments of other freight, and to 43 to 47 per cent. of the total probable amount of other freight. Moreover, the earnings from the live stock and fresh meat were at an average rate of about $9 per ton, while on the other freight it was probably not more than about $5.50, and the gross earnings from live stock and meats shipped (by all roads) were but little less than the earnings from other reported shipments (excluding those going by the Chicago & Atlantic) of all other freight. This fact should always be taken into account in estimating the earnings and profits of the railroads which carry freight from Chicago. The other freight is not so large in volume as in some other years; the live stock and dressed beef is very nearly or quite as much as in any other year, and a larger proportion of the whole than in most other years.

For the five months ending with May the shipments from Chicago reported (incomplete for the last three months) have been:

Year.	Tons.	Year.	Tons.
1879	1,228,908	1883	1,122,182
1880	973,330	1884	1,329,360
1881	1,139,624	1885	1,593,501
1882	986,875	1886	826,601

It is not probable that the unreported shipments were more than 140,000 or 150,000 tons; and the larger amount would make the total Chicago shipments this year only 976,000 tons, which is less than in any other year except 1880 and nearly the same as then and in 1882. In 1879, 1882, 1884 and 1885 by far the larger part of the shipments of the five months were taken at very low rates. The profits on the business must have been less this year than in any other in which rates were maintained, but more than in the other four. The decrease since 1880 and 1881 for some of the old railroads must have been very large.

While the reports of Chicago shipments are incomplete this year, since February, owing to the refusal of the Chicago & Atlantic to report, the reports of the total east-bound movement over the trunk lines are more complete than before since 1882, because they include the movement over the Delaware, Lackawanna & Western and the West Shore, which was not reported until March. In the comparisons below, the shipments of these new roads are included for 1884 and 1885 as well as this year, however; and the only omission is of the Lackawanna shipments in 1883, when it first began to carry through:

1880.	1881.	1882.	1883.	1884.	1885.	1886.
838,511	930,214	699 337	813 908	809,962	923,743	992,907

Thus the total eastward movement (this includes all shipments from the western termini of the trunk lines or points further west to any points on the trunk lines, which takes in a great deal of local freight) was larger last May than in any previous May, 7½ per cent. more than last year and 12½ per cent. more than in 1884, in both of which years the through rate for grain was 15 cents per 100 lbs. from Chicago, against 25 cents this year.

This indicates several things, as that the unreported Chicago shipments were a large amount, that the total shipments from Chicago were a smaller proportion than usual of the total shipments from the West; but, more than all, that the railroads have received an unusually large amount of freight—flour, grain and lumber chiefly—from lake vessels. This latter was favored by rates higher than usual by the canal, and by an early opening of the lake, which enabled the railroads to take grain from vessels at Erie and Buffalo from the very first of the month.

The contrast with the Chicago shipments is remarkable, however, and shows how unsafe it is to judge of the general course of traffic from that of any one place, even if the place be the greatest of traffic centres, like Chicago.

These east-bound trunk-line shipments in May are also remarkable for the great increase they show over the shipments in April. The shipments in each of the first five months of the year have been for the last seven years, in tons:

Year.	Jan.	Feb.	March.	Apr l.	May.
1880	590,530	638,470	1,013,567	941,123	838,511
1881	763,307	709,417	881,903	889,135	930,214
1882	746,685	686,256	622,642	682,444	699,337
1883	853,251	731,328	976,448	688,674	813,908
1884	653,027	597,703	782,376	908,400	809,962
1885	871,947	842,213	1,121,252	1,012,630	923,743
1886	723,777	864,492	959,899	750,272	992,907

Thus the shipments this year were larger in May than in any previous month, which has happened before only in 1881, but then they were but 4½ per cent. more than in April, while this year they were 32 per cent. larger.

For the entire five months these east-bound trunk-line shipments have been:

Year.	Tons.	Year.	Tons.
1880	4,022,201	1884	3,751,468
1881	4,174,276	1885	4,771,785
1882	3,435,364	1886	4,291,347
1883	4,063,669		

Thus for the five months the shipments this year were larger than in any other except last year, though considerable shipments by the Lehigh Valley Railroad were not reported this year. The net earnings from this freight were doubtless considerably less than in 1880 and 1881, but as large as in 1883, and very much larger than in 1882, 1884 and 1885. It is to be remembered, however, that there were seven railroads carrying the freight this year, against six in 1883 and five in the previous years. The reported award of 15 per cent. of this business to the two new roads would leave but about 3,646,000 tons this year to the five old roads, which had it all in the first three years here named.

The through *west*-bound shipments over the trunk-lines, from New York, Boston, Philadelphia and Baltimore have been, in May:

Year.	Tons.	Year.	Tons.
1880	140,465	1884	162,196
1881	144,567	1885	159,166
1882	207,400	1886	140,292
1883	145,151		

Thus they were less this year than in any other of the seven—very nearly the same as in 1880, and but 3 per cent. less than in 1881 or 1883, but 12 per cent. less than last year, and 13½ per cent. less than in 1884. While the total decrease of these four cities was 18,874 on s from last year, the decrease of New York alone was 19,225 tons. Boston shipped very nearly as much as last year, Philadelphia a little more and more than in any other year except one; Baltimore 18 per cent. more than last year, though less than in most other years. This indicates that the causes which reduced the reported New York shipments so much (19½ per cent.) in May, had little effect elsewhere, and one of these causes, doubtless, was the competition of the Lehigh Valley Railroad for west-bound freight, which was more active in May than ever before, it having been felt heretofore chiefly in grain shipments to New York. It has been taking some west-bound freight all the year, however. We may not safely conclude, in view of this fact, that the trunk-line freight movement to the West was much smaller this year than last, though the rates were 30 per cent. lower then.

For the five months ending with May the west-bound shipments from the four cities have been:

Year.	Tons.	Year.	Tons.
1880	780,315	1884	807,210
1881	737,967	1885	755,848
1882	1,043,114	1886	721,022
1883	719,512		

The shipments were thus less this year than in any other except 1883; but these shipments have not varied very greatly from year to year, except in 1882. The decrease of 34,826 tons (4.6 per cent.) from last year may be no more than the Lehigh Valley shipments have been, and as the rates were 30 per cent. higher this year, the earnings, and especially the net earnings, from this traffic must have been much larger than in any year since 1883, and as much as in that year.

On the whole, the movement of through freight over the trunk lines was larger than seemed probable when the month opened, and the whole business makes a much better showing than some parts of it which lately seemed to indicate a decidedly unfavorable turn in business.

SHOULD THE OFFICE SEEK THE MAN?

Theoretically, in public service, this question has an affirmative answer. The neglect of right principles in practice results, in part, at least, from the fact that so few appointing officers have a constant supply of the back-bone-like-a-telegraph-pole quality which is indispensable to a successful exercise of appointing power. In railroad affairs the same excellent *theory* prevails, but modified practically by different causes; a chief weakening one being that the office (appointing power) seeks the man carelessly or *unintelligently*. Another is the unwritten law of succession or promotion, which is very often the apology for filling a vacancy with the man from the next lower grade, without sufficient regard to his abilities, because it saves considerable trouble, some investigation, and, forsooth, the limited salary renders it more than probable that time spent in hunting for the ideal person would be wasted even if he were found. Superintendents hesitate to take an extra good man from another road, for a conductor, for example, because, among other reasons, they dislike to do even partial injustice to their own men in lower grades; whereas if they would give these men, not only ample opportunity, but appreciable assistance, in improving themselves, they would, with something definite for the men to aim at, find the temptation to look "outside the family" wholly removed. The practice of searching for a perfectly qualified man for a given position does indeed obtain considerably in the higher circles of railroad management; but what we wish here to insist on is, the desirability of applying the principle to the lower grades; nay, the necessity of so applying it if decent progress is to be made. It is high time that we learn that serving the public with brains *pays*, and that the brains cannot all be concentrated in the upper tiers. The knowledge that annoyances caused by unskillful or shiftless conductors or ticket-sellers can be redressed on application to the General Manager will not always satisfy patrons, especially after some enter-

prising superintendent has improved his service enough to warrant him in asking the public *to compare his men* with those of other companies. It is already fashionable to ask the public—in the excessively diffident manner peculiar to general passenger agents, though—to compare various natural and acquired advantages with the shocking deficiencies visible in the same department of competitors' lines; why should not quick and satisfactory adjustment of all annoyances (small as well as great) be one of the things to "point with pride" to? General passenger agents ought to remember that the public has many hundred times as many transactions with their subordinates as with themselves, and that these transactions are of such a nature that the aforesaid public looks upon what it calls a railroad "official" (a baggage-master, for instance) with an eye quite different from that with which a self-sufficient G. P. A. looks upon one of his lowest servants; albeit both are contemplating the same individual. Customers expect, or at least desire, that every railroad servant they come in contact with shall be as skilled, as faithful and a spleasant to deal with as the General Traffic Manager himself; and although it is not just yet practicable to pay two or three thousand dollars a year and thus get these desirable qualities in the subordinate places, there is ample room for a beginning in improvement, and ample evidence that it is practicable.

But these remarks concerning the passenger department merely remind us of one out of many instances where improvement in the *personnel* of the service is desirable. It is not necessary to enumerate the cases where improvement is needed; let us, rather, consider how to treat a necessity which admittedly exists.

The bugbear that frightens so many away from the right method of selecting help is the apparently (and, perhaps, really) excessive difference between the cost of just the man that is wanted and the market value of the "ordinary run." This may be familiarly illustrated by parallel cases in lesser affairs. If one resolves to spend a certain sum, say twenty dollars, for a suit of clothes he can get as good as his neighbor wears, and can very likely have "workmanship and material equal to custom-made;" but if he wants the coat a single inch longer than the prevailing style, or if he wants any little peculiarity of cut or fit; in short, if he wants the clothes for the man instead of fitting the man to the clothes, he must go to a tailor and pay probably *fifty per cent.* more for advantages which seem to be of comparatively trifling cost. A pair of shoes of good leather and good workmanship can be bought for, say, four to six dollars, but the desire for a cent's worth of powder to prevent squeaking, or a dime's worth of extra work to make the shoe perfectly comfortable, necessitates "making to order," which very likely adds even more than half to the price. These comparisons may not exactly fit the case in hand, but they show the nature of the problem. It is the *magnitude* of the differences that scares off those who attempt to attack it, and the reduction of these differences is the point at issue.

A well-established and *well-known* plan of engaging new or promoting old employés, or, in other words, systematized selection of men, the adoption of some of the methods of a well-organized government civil service would be a valuable feature in many departments of railroad business. Railroads could probably adopt many of the best features of the government plan without burdening themselves with the objectionable ones. Government "of, by and for the people" has limitations which private or semi-private corporations would not be subject to. We do not by any means advise the substitution of an inflexible machine for the strong common sense and knowledge of human nature which a good superintendent or other employing officer should have, but rather to suggest the "machine" feature as a valuable auxiliary to the latter. Certainly if all the employés in the more skilled grades of service knew precisely what would be required of them in case of promotion, and could have an opportunity of studying at their leisure the underlying principles and the practical details of the positions they aspire to, there would be enough of them who would avail themselves of the privilege, so that the superior would really have a much more satisfactory list to select from than he now has. Of course a high standard of requirements would weed out the lazy and careless, and tend to increase the compensation above what is necessary to fill the places with men who are only partially or superficially fitted for them; but the right kind of a plan, discreetly inaugurated, ought not to add any fictitious value to the services of an employé in any grade; and it is the fear of such false estimates that deters many from taking action.

That painstaking carefulness in selecting men shows its value in tangible results, needs, we trust, no argument. Every one has the testimony of more or less well defined cases within his own observation. Who has not noticed that certain freight agents, who have an eye for esthetics, seem always to have clerks who are good penmen, while others seem to take a step downward every time they make a change? Those who succeed in picking out good men, where others would say there was a scarcity of proper material, do not attribute their success to innate sagacity or acuteness so much as to patient and careful attention to the question in hand. If good penmanship be the main point, considerations of family or other favoritism, or of gentility, or proficiency in dead languages are not allowed to obscure the primary object sought. Some men have uniform "good luck" in selecting honest handlers for their money; in reality the "luck" is the right kind of judgment in comparing characters. The great desideratum is to have this kind of "luck" made available in all departments. When achieved, its chief drawback will be the prompt way in which it will show us that we "cannot get all the cardinal virtues for thirteen dollars a month," as the delinquent soldier told his captain when reprimanded; but we know that already. When good penmanship, and honesty, and bright mental faculties, and various other virtues are sought *in one person*, there is indeed a sudden complication introduced into the problem, and the search has often to be directed towards entirely different fields; but, that one-ideaed men are not proper persons for either the operating or commercial department of a railroad, we think no one will deny. And by getting up a more or less enthusiastic rivalry for a share of this "good luck" it may perhaps be possible to improve our methods in a semi-unconscious manner, similar to the way in which Congress resumed specie payments, by ordering it done at a future date, and then hiding its face behind its hands; or to the plan of the stingy but resolute deacon who shut his eyes while putting the money in the missionary box, and then bade his lower self "grin and bear it" as best it could. By fixing the attention on the objects aimed at, and the advantages expected, the question of money outlay may be retired to a less prominent place, until actual experience shall have a chance to prove that immediate pecuniary considerations ought not to be treated as the *only* important issue. Of one thing we may be certain, any railroad can get a man (or men) who will select plenty of men of excellence for all its departments, if only the means and authority be granted. There is no sense in saying that human fallibility prevents further improvement in the appointing power, or that even the most intuitive judge of men cannot be helped by means of system and combination of "wisdom of many minds."

In selecting, testing and recording the qualities and promoting men for a great civil administration like one of our railroads, much more is to be learned from the experience of the civil service corps of European, and especially of Continental countries, than from our own; for the reason that we are but beginning to have a system, and scarcely any department of the government, except the army and navy, is yet recognized as offering a legitimate permanent career, like a trade or profession, which one may enter with almost the certainty of permanent occupation if fairly faithful and intelligent, with the probability of some promotion, and with the chance of reaching very high position. All these railroad service, and all these many branches of government service offer in Europe. But there the organization has been so developed as to present certain definite grades, the qualifications for each of which are well defined, so that every man knows very well what he must be able to do before he can possibly enter the next grade above that which he at the time occupies. The result is that nearly every man in the service is doing all he can to qualify himself for the next higher position, and knows precisely what it is he must learn to become a candidate for it. As there, especially in Germany, the governments have long worked railroads and systems of railroads more or less extensive, they have developed a railroad curriculum, as it were, having a highly organized railroad administration, with well defined grades, fixed requirements for entrance and promotion, etc., very much like an army.

Now there is no doubt that there are elements of weakness in every administrative organization of this kind, and that it does not always succeed, and even does not generally succeed in securing the maximum efficiency in conducting affairs—the same degree of energy, enterprise and intelligence which is often found in the conduct of a small business, especially where the owner or owners are able to superintend every department, and select their men from an intimate knowledge of what they have seen them do, having every motive to select the most capable. But we must remember that it is not possible to conduct the business of a great corporation—still less of a government—in that way. The work must be directed very largely by men who have not a direct pecuniary interest in the result, and the problem is to secure the most effective administration possible under the circumstances, and one suitable to the circumstances. One of the needs of such an administration is to establish some general requirements for entering its service, and another is to have every one of its employés who exercises authority or supervision over others keep an account of the qualifications of his men—to be able to tell how they do their work, how trustworthy they are, and what they are capable of. Now to do this so that the higher officers may know the qualifications of the employés with whom they do not deal directly, there must be some generally accepted standard of qualifications for each position. The division master mechanic certifies that Kelly is a good engineman. But wherein is he "good?" To know whether he should be selected to take out the Sunday morning newspaper express we need to know in what degree he possesses several different qualities, physical, intellectual and moral. And so in other branches of the service. To make the best use of a force of men, the directing authority must know their qualities intimately, so that he may use them to the best advantage, and not call from any services which he is unable to give. It is as with an engineer and his materials; he must know definitely the qualities of each material, else he may expose one to strains which it is unable to sustain and use another in wasteful quantities. He must know how to use his men also; but the art of dealing with them properly, a too much neglected art, though one of the most useful, can hardly be treated here. But when the qualifications for a position have been formulated to help us to select and use our men, they also enable the men who occupy or expect the places to direct their efforts intelligently toward the acquisition of the powers which will best fit them for the places.

It must not be forgotten that for nearly every place moral qualifications are of enormous importance. If a man is not punctual, faithful, sober and industrious, we can have little use for him. The difficulty of formulating and especially of ascertaining by anything except personal observation the presence and degree of these moral qualities is the chief obstacle in the way of any regular system of appointments and promotions in any service, and this makes it all the more desirable that these qualities in employés should be reported and recorded by their immediate superiors.

Now that the Prussian state railroad system has become so large, little manuals are appearing assuming to give the qualifications for almost all of the lower grades of the service. We notice one recently for switchmen. So much you must know before you can step upon the bottom rung of the ladder. These are good if well done, that is, if they show what really ought to be required, and will help the man to understand his work. The danger is that too much stress be laid on the things that can be learned from books or even from observation, and too little on the fundamental moral qualities which cannot be ascertained from any preliminary "competitive examination," but only by that never-ending competitive examination—actual service with others in the position occupied.

THE MASTER MECHANICS' CONVENTION.

Following its repeatedly expressed preference for cities over the summer resorts which the Master Car-Builders' Association affects, the Master Mechanics' Association held its annual convention this year in Boston. A cordial welcome was given the members, and, as if determined that they should see the city in its most characteristic aspect, a northeast storm greeted their arrival in the city, making the inside of the house decidedly preferable to the outside on the first day of the meeting. This had its advantages, however, and the hall was decidedly cool and comfortable. On the second day it cleared up, and the meeting ended under more genial skies, giving visitors an opportunity to inspect the many points of historic interest in the city, and to see some of the beauties of its suburbs.

The attendance was large, and much interest was shown in the proceedings; more, indeed, than might have been expected, when we consider that the Association had no burning question to dispose of, such as that which is now stirring up the sister Association. The opening address of President Barnett was short but, in earnest and well-chosen words, impressed upon the members the importance of considering the Uncertain in Locomotive Engineering; in other words, of the importance of experiment and of tests in actua service, and he addressed himself especially to the

younger members, with whom the future of the Association rests, urging them to maintain a high standard, and by no means to rest contented with past or present attainments.

While in one sense the Association is fortunate in its freedom from the persecutions of the "coupler fiend," the absence of this emphatic gentleman and his allies deprives it of one spur to action. The members this year are inclined to take things in a somewhat leisurely way, and to get through their work in a quiet and easy fashion, which is comfortable perhaps, but not exciting.

No inconsiderable part of the first day's session was wasted by a wholly unwarrantable attack on the Secretary, by a party whose motive could easily be divined. Mr. Setchel defended himself in a manly and spirited fashion, and the convention unanimously sat down upon his assailant, who succeeded, however, in securing much more time than should have been allowed him.

The Report on Improvements in Boiler Construction, in many respects an able and excellent report, was marred in some measure by too great good nature of the committee in appending to it a long and purely historical paper. The other reports were fully up to, or above, the standard of previous years.

The arrangements for the convention were generally good, although complaint might be made of some minor matters. The meetings were held in the lower hall of the Meionaon, a room sufficient in size and having very good acoustic properties, but dark, artificial light being required all through the day, and somewhat defective in ventilation. The hotel chosen for headquarters was, in many respects, very good, but it was lacking in one important point, having a very small lobby and no place where members and visitors could gather in any numbers. This made it difficult for members to find each other, and prevented some of the social intercourse which is so pleasant a feature of the meetings.

Another matter of which some complaint was made was the lack of room for exhibits. To this, however, it may be answered that it is not the business of the Association to supply such accommodations. It has been suggested that an allied organization might be formed to take upon itself this work. There are objections in the way, but the suggestion is worth consideration.

Upon the whole, the convention may be considered as successful and as fully up to the standard of previous gatherings of the Association. The only danger to be feared in the future is a disposition to be satisfied with the present standing of the Association, and to forget that to stand still is impossible; a technical association must go forward or backward, and a failure to advance is a sure sign of decay.

THE MASTER CAR-BUILDERS' CONVENTION.

The Master Car-Builders' Convention at Niagara Falls was a very pleasant one, and at its conclusion most of the members could derive solid satisfaction from the reflection that much useful work had been accomplished, and decided steps had been made toward settling some of the burning questions before the convention. The rules of interchange were amended after a very careful and thorough discussion by a very full house, and, as they had been previously threshed out by two excellent committees, it may reasonably be hoped that the present rules, thus trebly amended, may, as far as is humanly possible, satisfy every one. The discussion was conducted with an amount of tact, intelligence and good temper that reflected the highest credit on the master car-builders, and it is to be regretted that so few of the higher officers of the roads were present to hear how well their technical officers acquitted themselves. The only departure from good temper was made by a new representative who is not a car-builder.

The report of the Committee on the Freight Car-Coupler question says that, owing to various delays, for which the committee appears to think the car coupler inventors are chiefly to blame, some of the car couplers selected for trial at Buffalo have not yet received any extended practical tests. The committee does, however, consider that the trials, as far as they have gone, have proved that certain couplers are defective in principle. While they are still willing to continue the trials of all twelve couplers, they find that seven couplers have done better, or give more promise of doing better, than their fellows. It is very natural that the friends and representatives of the five couplers that are not mentioned should feel somewhat aggrieved at the verdict of the committee, and should call for the evidence. But it must be remembered that the general comment upon the decision of the committee at Buffalo was that twelve couplers were too many, and that the chosen few should have been contained in an even more select and exclusive circle. The committee has indicated the direction in which the performances of the couplers tried will narrow the circle, but at the same time they intimate that there is still room for new couplers, whose merits are sufficiently known, tried and appreciated. It may possibly chance that none of the seven couplers mentioned may be finally chosen. A new coupler or couplers may arise and outshine all others, while on the other hand, it is possible that a discarded coupler may be so greatly improved as to take a higher place. There is still hope for all, and it remains for the various inventors either to investigate the defects of their devices and if possible remedy those defects, or at once to retire from the contest.

The committee appears to have found that a careful test of a few cars in practical service, with a complete record of expenses, gives more information as to the real merits and shortcomings of a coupler than a haphazard application of one variety of coupler to a great number of cars, no proper records being kept.

The committee recommends railroads not to adopt in large numbers any particular coupler just yet. It is obvious that before the adoption of the final coupler or couplers, the effect of freight train brakes on couplers will have to be carefully considered. The application of a quick acting brake on a train of 50 freight cars will be a novel experience to many couplers, and will possible demonstrate that the satisfactory operation of powerful freight train brakes can only be secured when the couplers possess certain essential features. The testimony of the few who have had experience on this point differs materially at present but possibly the forthcoming brake trials at Burlington may give some authoritative information on this question.

The Committee on the question of Freight Train Brakes was able to announce that it had arranged for a most complete and exhaustive trial, and Mr. G. W. Rhodes, the chairman of the committee, and the Chicago, Burlington & Quincy Railroad, which bears the heavy expense of the trial, are to be congratulated on the industry and public spirit they display in promoting the general interests of all the railroads of the country. Will any other road imitate the example of the Chicago, Burlington & Quincy and undertake a similar set of car-coupler trials?

So far we have been able to congratulate the Association upon much solid progress; of the four great questions before them three, the Rules of Interchange, the selection of the best automatic car coupler and the adoption of an automatic freight train brake, have each advanced a step toward final solution. On the fourth question, which probably involves more maimed and disabled men than all the others together, the Association has hardly adopted the path of progress, but has rather adhered to old ideas, when both reason and actual practice demanded a change. We refer of course to the question of standard dead-blocks. As long as draw-bars differ in height, difficulty will be experienced in coupling cars with a link. Men will have to go between the cars to adjust matters, and a certain percentage of the men who have to do this in pursuit of their duty will lose their fingers, hands, arms and even lives. Many of these accidents will occur primarily because the draw-heads were not all of the same height, and links and pins have an awkward way of getting crooked and jamming and setting fast just when they ought to couple like birds in springtime. But many of the accidents will be caused because draw-timbers and draw-heads are apt to be knocked clear off, and then the cars will come together close enough to squeeze a man to death, because there are no dead-blocks to prevent it. An effort was made by Mr. Cloud, Mr. Forney and others to put an end to this state of things and provide standard dead-blocks that would not only save men by keeping the cars a certain distance apart, but would save draw-bar springs, the dead-blocks as proposed by Mr. Cloud meeting when the draw-bar springs were fully compressed. This is emphatically a law of the Medes and Persians that ought to prevail throughout the country, and its rejection is greatly to be regretted.

The only argument brought against it was that it altered an existing standard, but it was clearly shown that though this standard had been promulgated several years ago, it had not gained general adherence, and that the proposed height of draw-bar coincided with the average of general practice. The standard height proposed had already become general, and is, therefore, practically the present standard. The adoption of a uniform height of draw-bar and the use of a uniform pattern of dead-blocks are absolutely essential to the safety of trainmen and unless some general agreement is reached on these points, the advantages of the best automatic car couplers will be partially neutralized and add little to the safety of the train hands. If two cars equipped with the best coupler meet with such a difference of height that the coupling device will not act automatically, it is obvious that the man must go between the cars and couple them by hand; and if one or both of these cars is equipped with single deadwoods standing out but a few inches beyond the end sill, the man performing the coupling stands a chance of being crushed to death. This state of things should not be allowed to exist, and we trust the next convention, to be held at Minneapolis, will be actuated by a more progressive spirit worthy of that place, and take effectual means to settle the dead-block question, and also bring nearer a final decision as to the car coupler and freight train brake of the future.

The Form of Rail Heads.

Those who take an interest in the question of the proper form of the head and corners of rails, and whether or not the corner should be rounded off to fit the fillet or wheel flanges accurately, will find an instructive object lesson on that subject on the Pennsylvania Railroad, just west of Coatesville station, 38 miles from Philadelphia. Those who are in any manner responsible for the form of rails, and are doubtful as to what form they ought to select, ought by all means, we think, to take the trouble to visit the point named and examine for themselves. The same thing can no doubt be observed at many other points on the line, the precise locality of which we are unable to specify.

The Pennsylvania Railroad, as those who keep track of such matters know, made a change of standard about two years ago, the salient feature of which, besides the important one of a great increase of section, was a change of the radius of the corner of the head from $\frac{5\frac{1}{2}}{16}$ and $\frac{7}{16}$ in., which were the older standards, to $\frac{5}{8}\left(\frac{10}{16}\right)$ in radius, with the view, as was generally understood, of making it correspond more closely to the radius of the inner fillet of the wheel-flange, so that the two might come more completely into contact. The various standards were as follows:

	Radius of corner of head.
Standard of 1870 (?) to 1875, 60-lb. rail,	$\frac{11}{32} = \frac{5\frac{1}{2}}{16}$
" 1875, " "	$\frac{7}{16}$
" 1884, 70-lb. "	$\frac{5}{8} = \frac{10}{16}$
" 1885, 75-lb. "	$\frac{5}{8} = \frac{10}{16}$

At the point mentioned—and no doubt at many others—the first and last of these standards may be seen in juxaposition to each other on parallel tracks. The north track is laid with the old standard, which was put down in 1872–3, and has accordingly been in service twelve or thirteen years. Being plainly of superior quality, the rails are still in excellent condition, but have lost a good deal in height.

The south track was relaid last season with the new pattern of 70-lbs. rails, which has accordingly been in service eight or nine months. These rails likewise appear to be of an excellent quality, and the wear they have so far sustained has hardly affected them at all, except in one most vital respect.

That respect is the flange-wear. Although the track is here on a dead straight line the contrast in that respect is most striking, and we cannot but think one of notable importance. The older rails, which the hard knocks of a dozen years have worn down greatly on top, bear hardly a mark on the side of having been touched by a flange at any time. The head has worn to a sharp and distinct corner of perhaps $\frac{1}{4}$ or $\frac{5}{8}$ in. radius, and the only marks below the corner are a few bright spots on projecting knobs, not anywhere enough to remove the original skin of the side of the rail, and hence, evidently, caused only by the passage of a few wheels a year with exceptionally sharp flanges.

The rails on the parallel track are already badly flange worn by their few months of service, the entire curved corner of the rail down to a level of over an inch below the top being brilliantly polished. The first impression when one looks at them is that they are very tight of gauge, but this is not the case. They are if anything a little wide of gauge and quite as wide as the rails on the parallel track. The grade is slight, and hardly such as to make any material difference.

No other difference of condition appearing, the conclusion therefore is inevitable that the difference in the form of the corner causes a marked increase of flange-wear, at least at first, and two queries naturally arise: first, if it has this effect in the green leaf what will it have in the dry, and secondly, if it has this effect on a tangent what will it have on a curve?

As to the latter we cannot speak from observation,

but it is now tolerably well known that there are two distinct periods in the life of an outside rail on a curve. The first is while the wear is chiefly confined to the corner and top, but does not extend to the side of the rail During this period the wear is comparatively slow, and with rails on easy curves or light traffic it lasts a number of years. The second period begins when the corner has worn so nearly to the form of the flange, that the latter begins to cut into the head of the rail, clear down to the point. During this period the rate of wear is very greatly increased, as it is but natural it should be, and likewise the danger of derailment. What then will be the probable effect of adopting such a form of rail that the second period begins from the first day the rail is laid down? In view of the preceding, it appears probable that it must be to increase greatly both the rate of wear and the danger of derailment by the flange climbing the rail.

As to tangent wear it appears more uncertain. The usual law is that whatever the original form of the rail it wears down with time to a pretty sharp corner, as may be seen on almost any section of a worn rail from a tangent, but whether this will be the case when flange-wear starts in from the beginning appears far more doubtful. As the flanges on one side or the other must normally be in contact with the side of the head, it appears more probable that flange wear as well as top wear will continue and so keep the corner of the rail of approximately the same form by wearing away the corner and side of the rail as fast or faster than the tread, because, in spite of the greater pressure on top, the tread merely rolls while the flange grinds. If so, it means a marked increase in rate of wear.

We have refrained from discussing this question from a theorotical point of view, knowing that there must, sooner or later, appear some evidence from experience. The above seems to be of that nature, and while perhaps not absolutely decisive, it is plainly such as to raise a strong presumption against the expediency of so rounding off rails that the curve of the flange will fit accurately against them.

New York Crain Receipts in May.

The New York grain receipts in May contrast sharply with the April receipts, having being more than three times as large. May is the first month of the canal receipts, and these amounted this year to nearly 40 per cent. of the total (including flour), and to nearly 50 per cent. (48.9) of the grain exclusive of flour, which latter does not go by canal. Still, the receipts by rail were twice as great as in April, which is a notable gain. The total receipts in May for successive years have been in bushels (grain and flour):

Year.	Bushels.	Year.	Bushels.
1879	10,963,772	1883	9,644,564
1880	13,409,943	1884	7,921,793
1881	13,870,370	1885	8,203,072
1882	9,611,566	1886	11.560,044

Thus the May receipts this year were the largest since 1881, and but 14 per cent. less than in 1880 and 16⅔ per cent. less than in 1881—years of phenomenally large receipts. It may be noted, however, that in 1878 the receipts were no less than 16,328,772, which is enormously greater than in any other year.

The receipts by railroad in these years have been:

Year.	Bushels.	P.c. of total.	Year.	Bushels.	P.c. of total
1879	7,471,529	68.1	1883	5,463 463	56.7
1880	5,058,597	37.7	1884	4,376,381	55.2
1881	8,306,261	60.0	1885	6,571,914	80.1
1882	4,526,891	47.1	1886	6,912,671	59.8

This shows that the receipts by rail this year were exceeded only in 1879 and 1881, in the last of which years the canal was open a much smaller part of the month. Considering that rail rates were 40 per cent. higher, and that the canal was open several days longer this year, the increase over 1885 and 1884 is remarkable; but it was probably partly due to the limited number of canal boats, as it is certain that they were all very busy this year, and they carried much more than in the two years previous, the total being larger.

The distribution of the May receipts among the several railroads was remarkable. The Erie, which in previous months of this year had carried less than usual, in May carried nearly twice as much as any other railroad and nearly two-fifths of the entire rail receipts, and the Lehigh Valley again appears as one of the chief sources of supply, for of the 999,580 bushels of grain reported as arriving by "other" than the specified routes, we may be sure that as much as 930,000 bushels, or 13⅓ per cent. of the total rail receipts, came by the Lehigh Valley—much more than was brought by either the Pennsylvania, the Lackawanna or the West Shore, while the Pennsylvania appears in May to have brought less grain to New York than any other railroad.

If we take grain alone, excluding flour, the receipts by the different railroads are still more unusual. The Erie brought no less than 44.3 per cent. of the whole, and next to it comes the Lehigh Valley, with more than 900,000 bushels, which is about one-fifth more than was brought by the New York Central, which on the average brings much more than any other railroad. The Pennsylvania brought only an insignificant quantity, which was but 2.3 per cent. of the total rail receipts.

It is understood that some special arrangements secured to the Erie the very large amount which it brought, and the Lehigh Valley's share was probably carried at less than the regular rates, which it is not bound to maintain, and perhaps also part of the shipments by another road. But the Erie and Lehigh Valley receipts together make 53 per cent. of the rail receipts of flour and grain, and the other rail receipts formed but 31⅓ per cent. of the total receipts, this being all that we can be sure was secured at the regular rail rate against canal competition.

The receipts by different railroads in each of the three spring months have been:

	March.	P.c.of total.	April.	P.c.of total.	May	P.c.of total.
N. Y. Cen.	3,368,685	33.4	1,019,477	28.9	1,430,605	20.7
Erie	2,051,292	20.4	743,496	21.1	2,727,819	39.4
Penna	1,051,323	10.4	362,732	10.3	484,481	7.0
Lackawanna	2,477,686	24.6	644,101	18.3	704,245	10.2
West Shore	655,595	6.5	234,134	6.6	565,941	8.2
Other roads	476,085	4 7	519,932	14.8	999,580	14.5
Total rail	10,080,676		2,523,872		6,912,671	

Thus Erie did last month just what the Lackawanna did in March—carried immensely more than its usual share of the grain. It did it at the expense of the New York Central and the Lackawanna chiefly. The Lehigh Valley brought about the same percentage of the rail grain in May as in April, but a very much larger quantity than ever before.

The total New York grain receipts for the five months ending with May for eight years have been:

Year.	Bushels.	Year.	Bushels.
1879	45,592,475	1883	41,659,277
1880	44.300,395	1884	31,833,137
1881	46,751,523	1885	45,049,086
1882	31,845,854	1886	40.041,698

The receipts this year were thus less than in any other of the eight years except 1882 and 1884, but they cannot be called small, being but one-ninth less than last year, and very nearly equal to the average of the last eight years. Of course the division of the traffic among three more roads has made it less valuable than formerly to the old roads, the three which brought 34,544,000 bushels in 1880, 38,571,000 in 1881 and even 25,175,000 in the very unfavorable year 1882, having brought but 24,349,000 bushels this year.

Chicago Live Stock and Dressed Beef Shipments in May.

The Chicago live cattle and dressed beef shipments in May were, in tons:

	1886.	1885.	Inc. or Dec.	P.c.
Cattle	25,035	36,159	— 10,854	30.0
Beef	23,163	19,369	+ 3,794	19.6

So that the cattle shipments were much less, and the beef shipments much larger this year than last. Reducing the cattle to beef, we have as the amount of *meat* shipped on the hoof and ready slaughtered:

	1886.	1885.	Inc. or Dec.	P. c.
On the hoof	14,171	20,247	— 6,076	30.0
Dressed	23,163	19,369	+ 3,794	19.6
Total	37,334	39,616	— 2.284	5.8
P. c. dressed	62.0	48.9	+ 13.1	

Thus last year in May less than half the beef was shipped dressed; this year nearly five-eighths of it. For the five months of the year the shipments of cattle and beef have been, in tons:

	Jan.	Feb.	March.	April.	May.
Cattle	30,396	27,936	25,085	31,847	25,305
= to beef	17,022	15,644	14,048	17,834	14,171
Dressed beef	22,328	21.431	18,892	20,176	23,163
Total beef	39,350	37.075	32,940	38.010	37,334
P. c. dressed	56.7	57.8	57.3	53.1	62.0

In the first two months, when the rates were nominally 25 cents per 100 lbs. to New York for cattle, and 43¾ for dressed beef, 57.26 per cent. of all the meat went forward dressed: in the last three months, with the rates 35 cents for cattle and 65 for beef, 57.46 per cent. of the meat shipped was dressed—a very minute change. Compared with last year, the shipments were:

2 mos. to Feb 28:	1886.	1885.	Inc. or Dec.	P.c.
Cattle	58.332	75,347	— 17,015	22.6
= to beef	32,666	42,194	— 9,528	22.6
Dressed beef	43,759	32,964	+ 10,795	32.7
Total	76,425	75.158	+ 1,267	1.7
P. c. dressed	57.3	43.9	+ 13.4	....
3 mos to May 31	82,237	105,239	— 23.002	22.0
= to beef	46,053	58,934	— 12.881	22 0
Dressed beef	62,231	51,382	+ 10,849	21.1
Total beef	108,284	110,316	— 2,032	1.8
P. c. dressed	58.5	51 5	6.0	...

It appears from this that last year the dressed beef shipments rose from 44 per cent. of the whole in January and February to 51½ per cent. in the three spring months, so that though this year the proportion shipped dressed was as large in the spring as in the winter months, compared with last year the increase in dressed beef was 32.7 per cent. in the winter and 21 per cent. in the spring. But in the last of these months, May, the quantity shipped dressed was the largest ever shipped except in October last, and the percentage of the total shipped dressed (62 per cent.) larger than in any previous month except November last (62½ per cent.), and in November the large proportion dressed was due to small live cattle shipments rather than to large dressed beef shipments. The Chicago cattle shipments in May were slightly larger than in March and a tenth more than in November last, but with these exceptions were the smallest for years.

This indicates that the slaughtering of cattle in the West for Eastern consumption is still a growing business, though it does not grow so fast now as it used to. The above figures do not show the whole extent of it, because a very large number of cattle shipped as such from Chicago are slaughtered at Hammond, on the Indiana line, only a few miles from the city and forwarded thence dressed.

The proportion of beef shipped dressed is doubtless a much greater proportion of the Chicago shipments than of the total shipments to Eastern markets. No inconsiderable proportion of these come from Central Illinois, Indiana, Ohio and Kentucky, and never pass through Chicago, and for all these, except some from Central Illinois, there is no place on the way to market where provision is made for shipping dressed beef to the East.

The railroads west and northwest of Chicago are having a contest over through passenger business, which affects an important amount of business. It had its origin, apparently, over the St. Paul business. The fast trains put on by the two short lines naturally tend to reduce the share of the travel which the long Rock Island route can obtain.

In the course of their contest over this business the rates from St. Paul to Chicago were reduced one-third or more. This hurts the Milwaukee & St. Paul and the Northwestern chiefly, because they have most of the St. Paul business. It was in retaliation, therefore, that they made a very low second-class rate from points on the Rock Island to Chicago—$4.25 from Council Bluffs, Des Moines and Cedar Rapids alike. The same rate had been made from St. Paul to Chicago, and this the Rock Island (Albert Lea route) made its first-class rate, while the other roads charged $10. The first-class rate from Council Bluffs became $7. This hurt the Rock Island, which has a full share of the travel from Council Bluffs, etc. It then attacked the enemy's flank, as it were, by applying the cut Council Bluffs rate to as well as from all junction points of its controlled lines (Burlington, Cedar Rapids & Northern and Minneapolis & St. Louis) with the Northwestern and the Milwaukee & St. Paul—a considerable number of small places in Iowa and Minnesota, from which the distance is usually much shorter by the last-named roads, so that they may be presumed to carry most of the passengers—not very numerous, however.

As the fight grew fiercer, the reductions, first confined to east-bound tickets, were extended to west-bound; the low rates were made still lower, and at last advices the Rock Island had made a $3 limited rate from Chicago to St. Paul and Minneapolis, and the Milwaukee & St. Paul had responded by making the same rate between Chicago and Council Bluffs; and the Council Bluffs lines, which hitherto had alternated in running a train between Chicago and Council Bluffs, had announced that each would run one as on week days, and the St. Paul had put on a fast train between Chicago and Rock Island, and generally these two companies were doing their best to make the business unprofitable.

This is interesting as illustrating the way in which railroad wars spread. Each competitor seeks to spoil that business which is of greater importance to its rival than to itself, and in that way all the traffic which both contesting parties can reach is likely to be affected, which means with such big systems a considerable part of the travel of an immense territory. Indeed, we have not indicated the whole extent of the field where rates are affected. Kansas City usually has the same rates at Council Bluffs, and rates to Kansas City have not been changed in consequence of the war, but passengers are ticketed to Colorado, California, etc., by way either of Council Bluffs or Kansas City, and the rate must be alike by both routes; so for these tickets reading through Kansas City the $3 rate is made to that place as well as to Council Bluffs. Mr. Daniels, of the Central Passenger Committee, has had to get out "special war basing rate sheets" for points beyond St. Paul and Council Bluffs, and the reductions made by the contestants have been so numerous that they have kept him busy.

Debate on Freight Rates in the French Parliament.

There was during the month of March last a debate in the French Chamber of Deputies on railroad freight rates which continued for 14 days. The question now being before the British Parliament, a summary of this debate was prepared for the Foreign Office, printed and submitted to Parliament.

There was, a few years ago, a very warm contest over the general railroad policy of France, which at one time seemed likely to result in the working of the railroads directly by the government. The end of it was, however, that new arrangements were made with the six great companies, and their position was strengthened rather than otherwise. One of the concessions called for was a simplification of, and greater uniformity in, the rates, which was attained, as necessarily it must always be, unless there is a very great reduction in railroad profits, by an advance in some rates as well as a reduction in others.

As, naturally, the very low rates had been made for the purpose of developing or keeping a traffic which could not be had without them, the advances were a great injury to certain interests,and there have been especially great complaints against some of those of the Paris, Lyons & Mediterranean, the greatest of the six great companies. The debate was on resolutions that the government should negotiate with the companies to secure improvements in the present tariffs, and that a commission should be formed to revise those railroad rates which affect the importation of goods on which duties are levied, and that the present Parliamentary Railroad Committee of 33 shall have added to it 11 officers from the civil service of the state, the 44 to constitute a commission, whose duty it shall be to propose legislation calculated to give the government greater power and efficiency in railroad affairs.

One of the complaints made in the course of the debate was that low rates are made from Marseilles on imported wheat (doubtless from Russia and India) to places far to the north, where it competes with French wheat, on which higher rates are charged. The company's excuse is that American wheat imported at northern ports is carried to these places at very low rates, and that in order to get any of the traffic it has to make the low rates. If it did not make such rates, wheat would be imported just the same, but not at Marseilles, nor over its railroad. It was also complained against this railroad that it made rates much higher for wines and food products when shipped in small than when shipped in large quantities.

One deputy cited certain instances of differences in rates for similar distances. Thus from Dunkirk (a channel port) to Paris, 166 miles, the rate on grain is 92 cents per 100 lbs., while from Chateauroux (an interior point) to Paris, 165 miles, the charge is $1.42. But the deputy said the only way to get rid of the difference was to reduce the rate from Chateauroux, because if the rate from Dunkirk were raised the grain would come in by the Northern Canal and the Seine.

The great reductions sometimes made by special rates were illustrated by the fact that while by the regular rates the charge on grain from Nantes (a port on the west coast) to Orleans, 190 miles, is $1.54, by a special rate it is made $1.18; and the general rate from Nantes to Bourges, 214 miles, is $1.62; the special rate, $1.43. The rates were made partly to prevent the diversion of imports from Nantes to La Rochelle, and partly to meet the competition of the state railroads.

Differences in rates on lines of different companies were: 22,000 lbs. of manure were carried on the Eastern Railroad, subject to canal competition, 146 miles, for $9.07; on the Orleans Railroad, $19.30—0.565 and 1.202 cents per ton per mile, respectively. So for distances of 146 miles in ten-ton lots the Orleans charged 5.2 cents per 100 lbs., and the Eastern 4.1 cents; and for seeds in five-ton lots the same distance the Orleans charged 21½ and the Paris, Lyons & Mediterranean 13 cents per 100 lbs.

Special complaint was made of the rates on wines on the Paris, Lyons & Mediterranean, which were generally 2.52 cents per ton per mile for distances up to 62 miles, 2.24 thence up to 124 miles, and 1.82 cents for greater distances; while for wine imported from Italy the charge was but $8.77 per ton to Bercy, in France, from Asti, 532 miles, from Modena, 681 miles, and from Florence, 755 miles—or 1.65 cents, 1.29 cents and 1.17 cents per ton per mile respectively, the share of the French railroad for the same distance varying from $3.94 to $6.87. Similar rates were made on importations of Spanish wines. Wine is carried from Valentia or Alicante, Spanish towns, through Cette to Paris for but a trifle more than from the French town of Cette to Paris, on the plea that the Spanish wine will go by sea if a higher rate is charged. A great many cases of rates of this kind on imported goods were quoted; chiefly interesting to us as indicating the ordinary rates in France; as an import rate of $2.63 per ton for charcoal 250 miles, and an interior rate of $2.80 for 147 miles; an import rate of $3.27 for 302 miles, against interior rates of $4.47 and $4.30 for the same distance; also an import rate of $3.82 for 370 miles (Cologne to Paris). This latter is on the chief domestic fuel of Paris, and we should expect it to be one of the lowest rates; but it amounts to 1.032 cents per ton per mile, equivalent to 47 cents per 100 lbs. from Chicago to New York. One of the longest hauls mentioned is of wine from Havre to Lyons, 464 miles, the rate for which is $3.84 per ton, or 34 cents per 100 lbs., while the interior rate for the same distance is $8.27. Cotton is taken entirely across France, from Havre to Bâle, 470 miles, for $7.35 per ton (37 cents per 100). Cotton in 5-ton lots goes from Antwerp (Belgium) to the French manufacturing town Epinal for $5.22 per ton, and in 10-ton lots for $4.53.

The different routes do not seem always to attempt to compete with each other; thus from Antwerp to Bâle, 418 miles, the cotton rate is 20½ cents per 100 lbs.; from Havre to Bâle, 470 miles, 37 cents.

Coal rates quoted were 0.98, 1.04, 0.76 and 0.924 cent. per ton per mile for exports, and 0.70 and 0.672 cent for imports by another route from Belgium.

These rates were cited chiefly to indicate that the railroad rates often were adjusted so as to work against the protective duties levied by the government.

A defender of the French railroad companies cited the following rates per ton per mile on various freights in different European countries, but it is impossible to learn from the abstract prepared for Parliament whether these rate are *average* rates or "regular" rates, which may not often be adhered to:

	Grain.	Coal and coke.	Building mat'ls.	Manures.	Raw sugar.	Bar iron.
50 km. distances = 31 miles.						
Belgium	2 24	1.68	1.68	2.24	....	....
France	....	1.456	1.204	....	....	....
Northern R. R.	2.352	....	....	1.904	....	....
100 km. distance = 62 miles.						
Belgium	1.75	1.26	1.26	1.75	2.24	....
France	....	1.288	0.994	1.512	....	....
Northern R. R.	1.96	....	....	....	1.988	....
200 km. distance = 124 miles.						
Belgium	1.05	....	0.77	....	1.470	....
France	....	1.204	0 847	....	....	....
Northern R. R.	1.386	....	....	....	1 386	....
Eastern	1.350	....	....	....	1.526	1 356
P., L. & M.	1.540	....	....	....	....	....
Germany:						
5-ton lots	1.960	....	....	1.960	1.960	1 960
10-ton "	1.784	....	....	0.980	1.784	1.428
Italy:						
8-ton lots	1.680	1.288	....	*1.148	....	....
50-ton "	1.024	....	....	†0.840	....	....

* 5-ton lots. † 10-ton lots.

This speaker (Felix Faure, formerly Assistant Secretary of the Colonies) concluded that Belgium had lower rates than France on grain, coal, manure and building materials, but higher rates on raw sugar—a very important matter in France, which produces more sugar than it consumes. He explained that many of the special low tariffs made in connection with foreign railroads on imports were a part of what are called "reciprocity" tariffs, which give correspondingly low rates on certain French exports; and cited a case where certain firms complained of an import tariff, as increasing their competition, and secured its abolition. This stopped the importation of certain goods from England, but it brought with it the abolition of the reciprocal export tariff, which stopped the exportation of other goods to England, and then efforts were being made for the restoration of the old tariff. He said the number of these reciprocity tariffs was 39; of international tariffs, 18; of export tariffs without reciprocity, 33. He pointed out the competition of the railroads from French ports to Switzerland with the lines from Belgian and German ports, and also showed that the rates on Italian wine, etc., though lower than for similar distance in France, were still much higher than the rates by sea. Thus Spanish wine imported *via* Cette and thence by rail to Paris pays 52 francs, while shipments of French wine from Cette pay 49 francs; but the Spanish wine pays only 26 francs for carriage by sea to Rouen, and thence to Paris the rail rate is but 4 francs. The low rates on wheat from Marseilles simply enable the French railroad from Marseilles and the French vessels which bring the wheat there to carry part of the supply which otherwise would be carried wholly to the foreign port of Antwerp, and thence part of the way by the Belgian railroads to the French frontier.

Another speaker quoted some of the short-distance rates of the Paris, Lyons & Mediterranean road, the increase in which had been complained of. There is a constant terminal charge of 30 cents per ton, with 15 cents for registration duty (a tax). On one class the rates per ton per mile were 3.36 cents for 62 miles, 3.024 for 310 miles, and 2.492 for 683 miles.

On two others they were in cents per ton per mile:

	Miles. 15½.	31.	62.	310.	683
Class C	—	2.240	1.736	1.176	0.952
Class F	2 24	1.680	1.120	0.672	0 616

He complained that this was an unjust discrimination against the short distance traffic, as in Class C 70 cents is charged for carrying a ton 31 miles, and only $6 for carrying it 20 times as far, and to carry 20 tons 50 kilometres cost 80 francs, while to carry one ton 20 times as far the charge was only 35½ francs. This speaker can hardly have learned the alphabet of railroad business yet: the profit per mile on the long haul is probably greater, at these rates, than on the short one.

Mr. Camille Pelletan was one of the leaders in this debate, arguing that the state ought to buy the railroads and work them itself; but most speakers contented themselves with claiming for the government greater power over rates. No rate could ever be made without the approval of the government; but it has no authority to initiate changes.

The chief speech in support of the existing condition of things was made by Mr. Raynal, who was Minister of Public Works when the last arrangement with the companies was made, which was supposed to put an end to the movement for a State system. He said that $1,900,000,000 were invested in the French railroad system, which, with the present rates, yields 4¾ per cent. on the investment, including the sinking fund by which the stock is to be retired when, at the end of 100 years from their charter, they will become the property of the state. The rates probably admitted of improvement, but under them the number of passengers carried had increased from 111 millions in 1869 to 200 millions in 1882, and tons of freight carried from 44 millions to 88 millions. He urged caution in reducing rates; in better times it might be possible to abolish the tax of 23 per cent. on railroad transportation, which would make the French rates the cheapest in Europe or the world—wherein the ex-Minister was mistaken. He approved a recent arrangement whereby the railroads brought gas coal from Northeastern France to Bordeaux at 0.56 cent per ton per mile, whereby it was able to overcome English competition. This rate is equivalent to 25½ cents from New York to Chicago by the shortest route, and seems to be looked upon in France as a miracle of cheapness. As to import rates, the railroads were willing that they should be compelled to make rates as high as the water rates, but they were unwilling to make rates which would give the whole traffic to the water routes. There was a large traffic on the Seine in carrying wheat from Rouen, etc., at $1.40 per ton. The railroads had begged for the privilege of reducing their rates on this freight to $2.10, but they had been refused, because it was thought it might interfere with the navigation interests. The Seine traffic had grown rapidly, the tons carried from Havre or Rouen to Paris having been:

	1874.	1882.	1883.	1884.
Grain	58,300	200,200	199.100	189.200
Coal	52,800	....	91 300	90.200
Wine	17,600	.....	108,900	*139.700

Mr. Raynal also argued against immediate purchase by the state.

The Chamber, after the debate, passed resolutions approving the determination of the administration to negotiate with the railroads, and especially with the Mediterranean Company, for an improvement in their rates, and to establish the Committee of Forty-four to propose railroad legislation.

It seems to be expected that this committee will have much to do with regulating the French railroad rates, probably by reporting bills to the Chamber to effect the changes they deem desirable. Its 11 members from the government offices presumably will be railroad experts from the Ministry of Public Works, already familiar with rates, etc., as all of them have to pass through their hands for investigation and approval before they can go into force. This body will be peculiar in that three-fourths of it will be legislators, coming from different parts of the country, and able directly to affect legislation. It cannot be expected, however, that 33 members of the Parliament, elected on general political issues, and having to pass on the numberless questions which come before every such body, will ever have more than a very superficial understanding of railroad affairs. In legislation, however, the administration, as in England, takes the lead, and it is the advice of its 11 members of the Committee which will probably determine its action.

English Live Stock Traffic.

England, with its great cities and prosperous population, compared with other European countries, naturally has a large cattle traffic—that is, the quantity moved must be large. The distances are so short, however, that it might not make much of a figure in the earnings of the railroads. An article on the subject in the London *Railway News* shows, however, that some of the railroads have a considerable income from it. Thus, last year the London & Northwestern earned $1,076,989 from live stock, the Great Western $612,178, the Northeastern $470,003, and 20 English, Scotch and Irish railroads in the aggregate, $5,363,991.

The *Railway News* illustrates the consumption of London by a statement of the receipts for a series of years at the Metropolitan Cattle Market and the Foreign Cattle Market, which we are led to suppose include substantially the whole London receipts. This contrasts as follows with the receipts at New York in 1885:

	Cattle.	Sheep.	Swine.
London	307.140	1,316,711	15.044
New York	565,635	2,048,422	1,910,037

Thus New York received 84 per cent. more cattle and 55 per cent. more sheep than London, and 127 times as many hogs. The hogs going to New York are mostly packed there, and we may assume that London gets most of its supply of fresh as well as salt pork ready slaughtered.

The places supplied by New York—including besides that city, Brooklyn, Jersey City, Hoboken and Newark, have, in the aggregate, about half the population of London, but New York exported last year 159,515 live cattle and their equivalent in dressed beef slaughtered there, and 444,185 sheep, while London does not export. This leaves for the New York consumption 406,020 cattle and 1,604,237 sheep—32 per cent. more cattle and 22 per cent. more sheep than the London receipts.

The question of the relative consumption, however, is complicated by the great and increasing trade in dressed meat. The receipts are estimated to have been equivalent to 200,000 live cattle at New York and vicinity last year, while in the Central Market of London the receipts of meat butchered out of the city were 176,613 *long tons*, perhaps equal to 470,000 cattle, though it includes other meat than beef. Moreover, the English cattle are doubtless heavier on the average than those received at New York, and the sheep probably still more so.

The London Central Market receipts of dressed meat slaughtered out of the city for four years have been, in tons of 2,240 lbs:

1882.	1883.	1884.	1885.
129,941	149,275	160,574	176,613

a much less rapid increase than there has been in the dressed beef business in this country, but with very good reason, the distances the native cattle have to be carried being so much less.

The receipts of American meat at the London Central Market have increased steadily, but they still are small in proportion to the total London consumption, not to say our production. They have been for 10 years, in tons of 2,240 lbs.:

Year.	Tons.	Year.	Tons.
1876	5,513	1881	27,439
1877	14,641	1882	16,635
1878	19,370	1883	26,799
1879	20,751	1884	27,071
1880	25,836	1885	31,280

Since 1880 the *increase* has been 21 per cent., and equivalent perhaps to 14,500 head of cattle, or less than two days' receipts at New York, and the total receipts last year were equal to about 83,500 head, which is too small to have much effect on our trade.

The English railroads apparently make more comparatively than the American lines from the live stock traffic.

In 1884, the *tons* (2,000 lbs.) of live cattle and sheep brought to New York by the trunk lines, which is pretty nearly the whole supply, were 416,421, sheep making up 88,435 tons of that amount. This was equivalent, probably, to 833,000 cattle. At current rates for carrying live stock from Chicago to New York, which are doubtless higher than the rates actually received in 1884, the three trunk lines (east of Buffalo, Pittsburgh, etc.) would have received about $2,750,000 for carrying this quantity, which would give each on the average a smaller amount than the London & Northwestern, though the quantity carried by the New York roasd undoubtedly is immensely greater; for, as we have seen, there are many railroads which carry cattle to London, in place of the three which in 1884 almost exclusively supplied New York, and London, though so much larger than New York, does not receive so much live stock.

A very important part of the English supply of live stock comes from Ireland, records of which are kept, and this is somewhat like our Western cattle traffic, the country supplying it being agricultural chiefly, with few large towns, and the distance to market being considerable, though not compared with the distances here. It differs particularly, however, by the necessity of carrying all the cattle part of the way by sea—to some important places all of the way—so the amount of transportation which they afford is small compared with that which plains cattle, Iowa cattle or even Illinois cattle afford our railroads.

The total numbers of cattle and sheep imported into England from Ireland compare as follows with the receipts at Chicago:

Cattle:	1881.	1882.	1883.	1884.	1885.
Irish exports.	571,557	782,274	556,867	715 843	640,470
Chicago rect's	1,498,550	1,582,530	1,878,944	1,817,697	1,905,518
Sheep:					
Irish exports.	577,627	558,404	460,729	533,285	629,000
Chicago rec'ts	493,694	628,887	749,917	801,630	1,003,598
Swine:					
Irish exports	382 995	502.906	461,017	456 678	398,564
Chicago rect's	6,474,844	5,817,504	5,640,625	5,351,967	6,937,535

When we remember that Ireland has an area of only 32,516 square miles, which is not one-tenth that of the states of Illinois, Iowa, Nebraska, Missouri and Kansas, to say nothing of the almost limitless grazing plains further west, northwest and southwest, the comparison is really favorable to Ireland, although, of course, not all that go to market from the country west of Chicago go by way of Chicago.

The Peninsula & Oriental Steam Company, which is the great carrier between England and the Mediterranean and India, China, etc., has a fleet of 50 steamers, with 175,909 aggregate tonnage and 35,550 horse-power. Four of the steamers have each about 5,000 tons capacity and 1,000 horse-power, and 33 of them are of more than 3,000 tons capacity. Besides the steamers it has 21 steam tugs and launches. Thirteen of the steamers, which with the exception of two are the largest ones in the fleet, are of steel, and two of them have triple expansion engines. This company dates from 1839, and its purchaser, the "Peninsular Company," began in 1837 to carry the mails by steamer from Falmouth to Lisbon and Gibraltar, which had formerly been carried by sailing vessels. The history, therefore, is almost coincident with that of ocean steam navigation. Its first vessel was a wood steamer 74 feet long, of 206 tons burden, built in 1829; its first iron vessel was built in 1842, and its first steel vessel in 1880. Up to 1847 the usual steam pressure in its engines was 7 pounds per square inch; this rose slowly to 20 pounds in 1855, and since the introduction of the compound engine to 40 pounds in 1870, 90 pounds in 1881, and in the new triple expansion engines to 140 pounds now.

Some comparisons of 1885 with 1884 are as follows:

	1885.	1874.	Increase.	P. c.
Tonnage	175,911	116.295	59,616	51.3
Horse-power....	163,100	96,637	66,463	68.7
Nautical miles run.....	2,482,941	1,635,768	847'173	51.8
Tons coal burned by fleet.....	421,818	280.003	141,818	50.6

There has been meanwhile an increase of fully 20 per cent. in the average speed, in spite of which we see that the distance sailed has increased only about as much as the tonnage, which shows that the vessels must lie in port now more of the time than in 1874. The vessels of the company's fleet placed in line touching each other would extend over a distance of four miles.

Few even yet realize the extent to which our own Pacific coast has become the rival of the rest of the United States in supplying Europe with wheat. In the five months ending with May the exports from San Francisco and Portland, Ore., compare as follows with those from all Atlantic ports:

	1886	1885.
Pacific ports.....	13.291,687	14,480,069
Atlantic ports	13,916,770	13,821,288
Total.....	27,208,457	28,301,357
P. c. from Pacific....	48.8	51.2

The Pacific coast, however, exports but little flour, comparatively, while the Atlantic ports exported the equivalent of 12,214,426 bushels in flour this, and 18,627,970 last year.

Wheat and flour exports, after having been very light for a long time, have become positively large since navigation opened. For successive periods of four weeks each the exports from Atlantic ports to Europe, have been:

	Four weeks ending—				
	Feb. 13.	March 13.	April 10.	May 8.	June 5.
Flour..	287.567	278,(99	311,720	402,911	568,459
Wheat 1	676,737	1,885,103	2,2:9,948	3,395,573	7,129,429
Corn.....4	990,408	6.860,815	6,735,701	6,717,795	3,712,268

Thus the exports of wheat in the last four weeks period were more than twice as great as in the four weeks to May 8, more than three times as great as in the four weeks to April 10, and about four times as great as in the previous two periods.

The corn exports have fallen off largely in the last period, but taking everything together, the exports were decidedly larger in the last period than before this year. In the last eight weeks the exports of wheat and flour were equivalent to 14,894,817 bushels of wheat, while for the entire four months ending with April the entire exports to all countries from United States Atlantic ports had amounted to only 17,000,864 bushels, more than half of which was flour.

In this way the very large stock of wheat in the country, which has helped to keep down prices, has been greatly reduced, leaving it now very much less than last year, though still much greater than two years ago.

The Northwestern grain receipts have at last become fairly large, for the first time since March, having been 5,950,000 bushels in the week to June 5 and 4,713,000 the week before, against an average of 3,200,000 for the seven weeks previous, in which the largest receipts were 3,686,000 bushels. This indicates that the farmers had so far finished their spring work as to be able to market some of their surplus grain, and that the surplus is considerable.

The receipts of the week to June 5 last were the largest there have been before harvest since 1880, except in some winter weeks of 1883. The shipments now are chiefly corn and oats, though the wheat receipts also are much larger than they were. The increase at Milwaukee which we noticed last week has continued, and in the week to June 5 it received more wheat than during the entire six weeks to May 15, and had 32 8 per cent. of the total Northwestern receipts, while Duluth had 34 per cent. and no other place more than 11½ per cent. It is quite possible that there will be a heavy grain movement now; if there is such a movement at any time before harvest, it will come now.

The chief obstacle to the strict maintenance of east-bound rates this season has been the position of the Chicago & Atlantic outside of the pool. It is understood that now that company is willing to co-operate with the other roads, but it has a contract with the Wabash which is for the whole of this year, for hauling cars for it from their junction south of Chicago to their junction in Indiana, which gives the Wabash absolute freedom to take freight at any rate, the Chicago & Atlantic not sharing the rate and not knowing what freight is taken, but simply hauling the cars. The other railroads protest that no company which has agreed to maintain rates has a right to make such a contract, which takes away from it the power to control the rates on its own line, which it has promised to control and maintain, and that every agreement is valueless if such a contract may be made in spite of it.

The Chicago & Atlantic, it is understood, does not value the arrangement, but the Wabash insists that it shall keep its contract, so that it is the Wabash and not the Chicago & Atlantic which now stands in the way of a complete union at Chicago.

The Northwestern flour shipments continue to go by lake to an extent unprecedented of late years. In the last five weeks reported (ending June 5), out of a total of 1,046,539 barrels shipped, 591,947 barrels, or 56½ per cent., went by lake, and only 403,883 barrels (38½ per cent.) by rail, the other 5 per cent. going down the Mississippi. During the same five weeks the lake shipments of *grain* were not quite 60 per cent. of the total, and ordinarily the vessels have taken a much larger proportion of the grain than of the flour.

In the hurry of making up a telegraphic account of the Master Car-Builders' Convention last week, mention was made of the "Dixon" steel-tired wheel. As many of our readers doubtless divined, the wheel referred to was the "Dickson" steel-tired wheel, made by the Dickson Manufacturing Company, of Scranton, Pa.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Chicago, Burlington & Northern.—An increase of 19½ miles at various points is reported.

Fremont, Elkhorn & Missouri Valley.—The *Black Hills Branch* is extended north to Hermosa, Dak., 18 miles.

Illinois Central.—The *Yazoo & Mississippi Valley Branch* is extended from Lexington, Miss., to Sidon, 32 miles.

Kansas, Nebraska & Dakota.—Extended northward to Blue Mound, Kan., 22 miles.

San Antonio & Aransas Pass.—Track is laid from Corpus Christi, Tex., north 3 miles.

This is a total of 94½ miles on 5 lines, making in all 1,203 miles thus far reported for the current year. The new track reported to the corresponding date for 15 years has been:

	Miles.		Miles.		Miles.
1886...	1,203	1881.....	1,872	1876.....	656
1885.....	667	1880.....	1,768	1875..... ...	336
1884.....	1,077	1879...	732	1874..... ...	603
1883.....	1.900	1878.....	482	1873	1,387
1882.....	3,965	1877.....	595	1872.....	2,259

These figures include *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

American versus English Methods of Bridge Designing. Reprinted from the *Japan Mail.*

This pamphlet is the record of an extended controversy between Prof. J. A. L. Waddell and divers English engineers on questions of comparative bridge practice, with an occasional letter from Japanese engineers on either side, and with some letters from clergymen and other authorities on the subject. The least that can be said of it is that it is amusing, and the most that can be said of it is that it is rather instructive. Unfortunately for the latter end, the controversy was not by any means confined to technical points, but is almost throughout decidedly personal. As respects the merits of the controversy, there can be no doubt that Professor Waddell has the best of it, but his unsparing criticisms of the weak points of many of the structures in Japan, which are chiefly the work of English engineers, and which appear to be considerably below the level of the best English practice, so that they have many weak points, naturally provoked retort, and one regrets to observe, chiefly of a personal and inconsequential nature. Not in all cases, however; the dreary monotony is broken by one admirably-framed and good-tempered letter, that by Prof. W. C. Kernot, of the University of Melbourne, who after premising, "I am an Englishman and have never been in America. I do not know any American engineers. I have seen only one bridge of American construction, and that a small one, and any bias I may have is naturally in favor of English ways of doing things," adds with admirable candor, "Nevertheless I am convinced that American bridges are far in advance of the usual English type of shallow lattice-girder, and proceeds to give a calm and intelligent exposition of his reasons, which also furnish a natural explanation of why the controversy is so much more personal and so much less technical on one side than on the other. The *Japan Mail* should open a permanent engineering department.

The Civil Engineer's Pocket-Book, etc. By John C. Trautwine. Twenty-fifth thousand. Revised by J. C. Trautwine, Jr. John Wiley & Sons, New York.

Hardly more than a year ago we reviewed the revision of this valuable hand-book for the twenty-second thousand. In the present edition several of the defects which we there noted have been corrected, notably in the article on friction, and an earnest effort is plainly being made to avoid the danger which we noted, that a pocket-book, even if "revised" occasionally, may become gradually worthless as a trustworthy compendium of facts—at least for the use of the comparatively inexpert—from the fact that, where in the beginning nothing is admitted which is not known to be reliable, in the "revisions" nothing is excluded except what is known to be unreliable.

To avoid this danger completely takes almost as much knowledge and care, although not so much hard work and good judgment, as to prepare the work in the first place. Especially is this true as the lapse of time grows great, and it is already fifteen years since Mr. Trautwine's great work appeared.

Mr. Trautwine, Jr., appears to be fulfilling very well this rather exacting duty. Certainly if as great additions and changes are to be made in the book every year as this last year, the book is more likely to lose its value by the addition than by the retention of worthless matter, and we observe no such tendency in the matter last added.

The most important change in the present volume is perhaps the article on friction, which had become quite defective, having been based chiefly on Morin, and which has been entirely rewritten and nearly doubled in length. The more modern experimental results of Professor Thurston, Captain Galton and Mr. Westinghouse, and others, are given quite fully and well. Some notice of the interesting experiments of Mr. Beauchamp Tower and Mr. C. J. H. Woodbury, however, might well have been added. We notice an error in the statement of Mr. Wellington's results, in testing "grind-stone" roller-bearing car journals, page 374 *e*. It was found that the friction in starting, compared with common journals, was reduced in about the proportion of 1 to 4 as stated, but at a car-speed of 10 miles per hour, the two stood very nearly on an equality, or about as 1 to 1, instead of 1 to 2, as stated.

Other important changes, and judicious ones, have been in the articles on the "Flow of Water in Channels" and on "Timber Preservation," in both of which new material has recently come to light. The prices throughout the volume have been revised to date, and changes and additions of some considerable importance have been made in about a dozen places, with many more minor ones. It is to be regretted that the antiquated and objectionable plan for the ends of arch culverts, on page 704, should be still retained: but we cannot have everything.

Foreign Technical Notes.

At the beginning of this year 35.8 of locomotives, 17.7 of the passenger cars, 20.1 of the baggage cars, and 59 per cent of the post-office cars to Switzerland were equipped with some form of continuous brake, including the Hardy, the Heberlein, the Wenger and the Rörting. The Hardy and Heberlein prevailed.

Mr. Wenzel Hautschke, engineer of the Austrian Southern Railroad, has discussed the various forms of fireless locomotives, and their comparative value for working street railroads, arriving at the following conclusions:

	Honigmann.	Mekarski.	Lamm-Francq.
Horse-power per ton locomotive weight.	10	5	1.7
Cost per mile run, cents	5	7.2	8

The Honigmann engine is the caustic soda engine hereto.

fore described in the *Railroad Gazette*. The Lamm-Francq is a modification of the original hot-water locomotive brought out at New Orleans by Dr. Lamm. Hautschke gives the cost per mile for an ordinary steam tramway locomotive as 13.2 cents per mile, and of such locomotives designed for mountain grades, 18 cents per mile. The cost of maintenance he says is least with the Honigmann and greatest with the Mekarski. The greatest advantage of the Honigmann, he says, is the large amount of power stored with a single charge, it being able to run 62 miles with one charge, while the other two can go but 9 miles without being replenished.

Tabulated statements of the number of electric gongs by which the approach of the train is announced from point to point, especially at crossings, on German railroads, make the mean distance apart of these gongs 950 metres, or 3,116 ft., and on Austrian railroads 1.04 kilometres, or 3,411 ft.

These gongs are arranged on a circuit between two stations and are operated analogously to the block system. That is, station A announces to B that a train is ready to start, whereupon, if B knows of no obstacle, he acknowledges the signal by giving "all right," and A then presses the key which causes the gongs between A and B to strike.

The German roads are now generally arranged so that this system is a perfect block, telegraph stations being inserted where necessary between the stopping stations; but on the light traffic roads B is allowed to give "all right" without having received the last train that went into the block.

It will be perceived that even where not used as a block system, and apart from the warning given to trackmen and crossing tenders, these bells, which can be heard nearly, if not quite, from one to another, are a considerable aid to safe working, since a train in the block always gets warning of another train entering behind it.

These bells are used by combinations of blows to give a variety of information, such as "Train toward A!" "Send over engine!" "Stop all trains!" "Set your watches—noon!" "Train backing up on wrong track!"

Mr. W. Nördling contributes to the February *Annales des Ponts et Chaussées* an interesting little discussion of the effect of increased business on the ton-mile cost of traffic, which is chiefly an abridgment of a longer discussion which he published in German in Vienna.

He emphasizes the fact that in considering whether competitive business will pay, the question is not whether the rate obtained is up to the average cost per ton-mile, but whether it will pay for the increase in expense caused by the additional traffic.

By platting the Austrian railroad traffic graphically for the different roads, he has interpolated a curve from which the following table is taken, showing the relative expense of different amounts of business:

Density of traffic ton-miles per mile of road.....	Expense— Per mile of road.	Expense— Per ton-mile.	Additional cost of every 275,000 tons added— Per mile of road.	Additional cost of every 275,000 tons added— Per ton mile.	Constant expense per mile road.....	Variable expense, p. c. of total.....
	$1.030				$1,030	
275,000	2,640	0.918 ct.	$1,610	0.560 ct.	1,030	61.0
550,000	4,057	0.705 "	1,417	0.493 "	1,224	69.8
825,000	5,345	0.616 "	1,288	0.448 "	1,481	72.3
1,100,000	6,504	0.566 "	1,159	0.402 "	1,868	71.3
1,375,000	7,535	0.526 "	1,030	0.357 "	2,383	68.4
1,650,000	8,372	0.487 "	837	0.291 "	3,349	60.0
1,925,000	9,016	0.448 "	644	0.224 "	4,508	50.0

It will be seen that the table shows (in the third column) a constant decrease in the average cost per ton-mile as the traffic increases, and the addition to the expense per ton-mile of the traffic added decreases in a very striking way (fifth column). But, on the other hand, the proportion of the variable expense caused by the movement of traffic to the general expense of maintenance and management (last column) reaches its maximum with a traffic of 825,000 tons per mile, and then falls off. Mr. Nördling's opinion, fortified by the form of the curve and from general principles somewhat evident, is that this percentage of variable to total expenses must attain a minimum with a certain amount of traffic, and thence tend steadily to approximate 100; the cost of moving additional freight becoming more and more constant and more nearly equal to the average cost of the whole traffic, though always somewhat lower.

A curious point made evident by the traffic curve developed by Mr. Nördling is the advantage for profit possessed by a main line with heavy traffic with branches of comparatively light business over a road doing the same amount of business uniformly diffused over the whole system.

Thus, if we had two lines of the same length, one with a traffic of 275,000 tons, and the other with 825,000 tons, their joint cost of operation from the table would be: $2,640 + $5,345 = $7,985 per mile, while a road with a traffic equal to the average of the two, or 1,100,000 tons, would cost $6,504 per mile.

If, however, the system in question were one in which the traffic was not sufficient to pay the minimum expense shown by the table to exist with the feeblest traffic, the advantage of the combination is lost, and the branch road becomes a sucker instead of a feeder.

Von Borries, the most prominent exponent of the compound locomotive in Germany, has in an article published in *Glaser's Annalen* for May discussed the subject of economy in railroad traffic.

He observes that the great difficulty in making savings is the fact that saving or extravagance is chiefly noticeable in the unit expense (expense per mile of engine service) for maintenance, coal consumption and wages. The distance run in doing any particular piece of work is, on the other hand, not always easy for the officials interested to ascertain, nor can the good judgment or the reverse of such disposition of power be always well passed upon by officials not directly on the spot, while extravagance in this item is of the greatest detriment, because it acts upon all the elements of expense at once. Hence the desirability of having officials in charge not only well trained as railroad men, but entirely familiar with the work in question.

He makes the statement for Germany, which will probably be echoed almost everywhere in the United States, that the passenger business, as a whole, does little more than pay expenses, revenue being derived almost solely from freight business.

He attributes this to an effect similar to that of direct and indirect taxes; the former, being felt by all concerned, are resisted more strenuously than taxes which are not felt directly by the tax-payer.

So with passenger traffic: every person concerned feels a high tariff at once, while with freight, the party who really pays the rate—the party consuming the goods—does not realize where the shoe pinches.

Nördling believes the passenger traffic to be the best field for economy, and directs attention to the fact that, owing to the multiplication of classes, the carriages are on an average for the Prussian roads only 23.9 per cent. occupied. He refers also with approval to the attempts to consolidate the number of classes to two.

In comparing the cost of running a given train in which the number of passenger carriages is reduced one-third, from 9 to 6, and the total number of cars from 11 to 8, which he does with a careful detail of expenses, the following elements enter as constant: Maintenance of engine, wages of engine hands; as variable he treats coal consumption, oil and water, maintenance of passenger cars, heating, lighting and axle-oiling, train gang (one less guard), wear of track.

He deduces with the above assumption a saving of 14 per-cent. in expenses.

He then proceeds to make a very comprehensive argument for the introduction of the American system as an economical measure, avoiding the evils of the coupé system, which entails the minute subdivision first into four classes, and then into "ladies," "smokers," and "ordinary" compartments, in each of the three upper classes. He states that it is an observed fact that the German cars which are provided with a side passage are more popular than the others, although this passage cuts off the view partly on one side.

He devotes much attention to the avoidance of doubling engines for express trains, which seems to be so frequent on occasions as to be a very serious detriment to economy of working.

The running of light freights is another source of extravagance in operation referred to. The average freight train on the Prussian roads in 1884-85 was 72 axles, while the engines were capable, on an average, of pulling 100 to 120.

The *Revue Générale des Chemins de Fer* for November last publishes an account, with illustrations, of Hodgson's interlocking block system apparatus exhibited by Messrs. Saxby & Farmer at the Antwerp Exibition last year.

The details of the apparatus are too complicated to be understood easily without a working model, hence we confine ourselves to a description of the general idea and mode of operation, which are as follows:

The object is to combine with the operation of the usual hand block an electric automatic check upon the operations of the signalmen, interlocking the apparatus so as to make it impossible to put the entrance signal of any block at "line clear" while a train is in the block.

This is effected by an ingenious and somewhat complicated mechanism which works the following series of interlockings: The signalman at the further end of a block after receiving the signal "train in" from the beginning of the block, cannot give "train out" until his apparatus is locked by the passage of the train over a pedal. At the entrance of the block the apparatus illustrated makes it impossible for the signalman to set his signal at "line clear" after the passage of a train, until he has received "train out" from the other end, and an improvement on the illustrated apparatus returns the signal automatically to "danger" after the passage of a train if the signalman does not do so. The block signaling apparatus is interlocked as usual with the switches, so that these must all be right for the block before the advance signal can be given.

A number of defects in this system are suggested by the *Revue*. It reserves its judgment on the pedal, but pedal systems can never find much favor with us, on account of the disturbance of snow and ice. It calls attention to the fact that to enable the signalman to operate the apparatus when the pedal is out of order, he is provided with a key to unlock his apparatus in case of need, and it has actually happened in Belgium that a sleepy signalman has caused an accident by thus over-riding the pedal check. The *Revue* remarks: "The human will can never be interlocked, and under these circumstances the intervention of the train cannot be considered an absolute guarantee of security."

Another disadvantage suggested by the *Revue* lies in the fact that the pedal must be placed beyond a station ground in order to avoid its action being interfered with by switching, and as it must lie outside of the block to be protected, a train arriving at a station where it was to be passed by another must run beyond the station to the pedal and then back up—a manifest inconvenience. Furthermore, it would help rather than hinder such an accident as that which recently took place on the Hackensack Meadows on the Pennsylvania Railroad, in a case where a train having passed the pedal backed down again over it, which might cause the presence of three trains on the block at once.

TECHNICAL.

Manufacturing and Business.

The Prospect Machine & Engine Co. in Cleveland, O., is building several Cummer engines of large size, and has recently completed several of these engines for different parties.

Alfred Box & Co. in Philadelphia have recently sold several of their improved radial drills to the Union Bridge Co. They have filled several other orders for these drills, including two for an extra large size.

The Rail Market.

Steel Rails.—Considerable business is reported, several large orders having been placed. Quotations are $35.50@$36 per ton at eastern mills for summer delivery, and $34.50@$35 for fall and winter orders. Some demand for light rails is reported, and quotations are $36.50@$39, according to section.

Rail Fastenings.—Quotations are steady at 2.40 cents per pound for spikes in Pittsburgh; 2.75@3.10 for track-bolts and 1.65@1.80 for splice-bars.

Old Rails.—More inquiry for old iron rails is reported, but few sales, and quotations are nominal at $18.50@$20 per ton at tidewater. Old steel rails are quoted at $21@$22 per ton in Pittsburgh.

Sinking Embankments in Jersey City.

The two railroads that are engaged in the construction of the spur from the West Shore depot to Bergen Point, and of the spurs from the several railroad depots in Jersey City to the point at the foot of Hudson City hill at which the Great Union Depot is to be situated, are having a phenomenal experience with their work. The Pennsylvania Railroad Company is building a high embankment across the streets at the foot of the hill, and then around the east side of the hill. The Junction Railroad Company, in which all the roads, including the West Shore, are said to be interested, is preparing to build a piled trestle at an angle of about 45° with the Pennsylvania Railroad's embankment. The Pennsylvania Railroad system of construction is to erect a simple trestle, and then fill in around it. The trestle and filling are being put on made ground, and it is not an unusual thing for the laborers, on going to work in the morning, to find the trestle and filling 20 ft. below the level at which they had been left the night before. One night the trestle sank 28 ft. The city at that point rests on a crust above a marsh of unknown depth, and the filling-in done by the road sinks below the earthy crust into the marsh, and, spreading, affects the level of the land many feet distant from it.

At Second street, between Pryor and Merseles streets, there stood eighteen houses. They had been purchased by the Junction Railroad, which is to cross at that point, with the design of removing them to First and Third streets. It was discovered, however, that the filling at the Pennsylvania embankment a block away, sank into the marsh, spread under their foundations and lifted them in some cases 12 to 15 ft. above their usual level. They were in such danger of falling that their immediate removal became necessary, and all but two have been taken away. At the corner of Third and Merseles streets are six houses that have been raised high in the air by the swelling of the ground on which they stand. They have been shored and blocked up, and it is proposed to let them stay there if possible.

The houses thus affected by the filling in are at least 150 ft. away from the embankment. Second and Third streets at the place indicated are new streets, having just been graded. The phenomenon is not so noticeable at the older thoroughfare of First street, though it is very much nearer to the company's filling than Second and Third are. The houses that face on First street have not been affected, though the swelling of the land approaches so closely to them that their rear yards have been raised into terraces.—*New York Evening Post.*

English Ironwork Specifications.

The following items are embodied in the standard specifications of some of the leading railroads for bridge and roof ironwork:

1. The plates, bars, tees, angle tees, etc., are to be of the best quality, and all of British manufacture, capable of bearing the following strains: That for plates lengthwise, 21 tons per square inch; contraction of area at point of fracture, 8 per cent. For plates crosswise, 17 tons per square inch; contraction of area at point of fracture, 3 per cent. For angle and tee irons, 22 tons per square inch; contraction of area at point of fracture, 15 per cent. For flat bars, 23 tons per square inch; contraction of area at point of fracture, 20 per cent. For round bars up to 1½ in. diameter, 21 tons per square inch; contraction of area at point of fracture, 17 per cent. For round bars above 1½ in. diameter, 20 tons per square inch; contraction of area at point of fracture, 15 per cent.

2. All the iron work will be subjected to such tests as the engineer may direct, at the contractors' expense; and should any parts fail or be broken in the testing, or be objected to on account of bad workmanship or materials, the contractor must replace the same at his own cost. The engineer must be advised in writing when any considerable quantity of iron is in the contractor's works. The contractor must also provide for the use of the engineer, for testing purposes, bars, each 5 ft. long and 1 in. square (giving an exact sectional area of 1 in.), and which must be cast four for each girder, etc., from the same metal and at the same time as the girders, road plates, columns, or any other portions of work are run. Should any of the test pieces give results lower than 1 per cent. below the above strains, they will be rejected. Each test is taken independently of one another, and no averages are taken. The contractor will have to pay the cost of obtaining Mr. Kirkaldy's certificate that the iron comes up to the standard.

3. Before any setting out is done each plate must pass through the rolls three times, the first bending to a curve and the following ones straightening.

4. All plates (and bars if used instead of plates) are to be planed on their edges, and joints in each case are to butt evenly, by machine planing. This applies to flooring plates also, which must butt all round their four sides to the adjacent plates. When more than one plate forms the flange in thickness, each plate must be planed the same width, and to finish straight with the others. All rivet holes are to be truly punched with the overlapping plates, tees or angles, and where the holes in flanges are specified to be drilled, the whole of the plates must be put together and drilled through solid, smaller holes previously punched not being allowed; after which the sharp arris around each hole is to be taken off before any riveting is done. The rivet holes in all diagonal and vertical bracings in lattice girders, and cross-bracing or tees in solid web girders, are to be drilled and not

punched; and all tee-iron stiffeners or gussets and angle irons to be dressed off flush with the flanges top and bottom, and each to be made to template length in order that the flanges may be quite straight and without wave in any way.

5. No riveting will be allowed to commence until the whole girder is put together, and no drifting will be allowed after the riveting has commenced. All rivets to be of the sizes and pitch shown on the drawings, and must be upset throughout their whole length and entirely fill the hole. All rivet-heads to be of the proper size and carefully snapped, the two heads bedding truly on the plates and their centres coinciding with the centre of the rivet. Any that may be found loose or imperfect in any way whatver must be cut out and replaced at the contractor's expense. Rivets on bearings are to be countersunk, with all holes properly riveted to form a strong head, and in no case must the taper of the punch be taken as a sufficient spread for the head. All bolts and nuts to have a strong and chased thread cut upon them of uniform pitch, heads and nuts being hexagonal, and to have a washer under each nut, and when screwed up to have a clear thread standing through.

6. The metal for the castings shall be such a mixture of irons as is best adapted for the purpose, and shall be such that a bar 1 in. square and 4½ ft. between the supports shall bear without fracture not less than 550 lbs. in the centre. The castings, when cold, must be of the pattern and dimensions shown on the drawings, and all to be cast smooth, with sharp arrises, and free from air blows, twists and flaws of every description. The cast-iron bed plates and columns to have seatings of 8 lbs. lead for the full width and length of their bearings on masonry. The edges of all road plates, as well as all joints and bearing areas, to be placed to an even surface.

7. All columns shall be cast vertically, and in dry sand, and for the purpose of gauging the thickness of the metal, small holes are to be drilled where directed, and the thickness of metal shall be uniform in all parts of the circumference.

8. The whole of the ironwork shall be made of the exact dimensions shown on the respective drawings; any ironwork made of less dimensions than those shown on the drawings will be rejected; any excess of weight beyond 3 per cent., caused by the given dimensions having been exceeded, will not be paid for. Before being sent out of the works the whole must be carefully erected and fitted together in the maker's yard, and each piece numbered so as to come together again and correspond when being permanently fixed in position.

9. If steel rollers for expansion are used, they must be of the best quality of Bessemer steel, truly planed on faces, each roller to be of the same diameter in order to insure a perfect bearing, care being taken that room is left at each end for the girders to expand or contract, and that the frame is left in the centre of the space between the angle iron stops when the girder is brought to bear upon the rollers.

10. All wrought-iron girders to have seatings of the best hair felt in two or more layers. The schedule price of the girders to cover the cost of this.

11. The wires, surfaces of all plates, bars, etc., which are to be riveted together, shall be well coated with best oxide paint before joining. The whole of the cast and wrought-iron work to have one coating of best red lead before fixing, and four other coats of approved colors after completed. The underside of all girders and road plates, where directed, shall have four coats black varnish on the completion of the bridge. The cost of painting, varnishing, etc., in all cases shall be included in the prices of the ironwork. The ironwork shall not be painted before an examination has been made by or under the orders of the engineer, who must be apprised in writing when it is ready. All the wrought-iron work shall be well oiled before commencing to build the girders.—*Mechanical World.*

THE SCRAP HEAP.

A Train Wrecker Sentenced.

A dispatch from St. Louis, June 10, says: "H. D. Davis, Master Workman of the Knights of Labor assembly at Pacific, Mo., a leader in the late strike, was sentenced to two years in the penitentiary and fined $500 in the Circuit Court of Franklin County, at Union, Mo., yesterday, for attempting to wreck the fast freight train that left St. Louis during the strike, on March 24, and shooting at the guards. Pacific was the hot-bed of the late strike, and was the last place to surrender. This is the first felony conviction growing out of the late strike."

Fast Time.

Papers down the road are talking of the fast run made by the Orange County Express (on the New York, Lake Erie & Western road) on Wednesday of last week. When the train left Tuxedo Park it was 15 minutes late, but the engineer determined, if the train held together, to get to Jersey City on time, and pulling the throttle wide open soon had the train dashing citywards at a rate that made the telegraph poles seem as close together as fence posts. Noticing that the train was running very rapidly its time was very carefully taken, and when it came to a full stop in the Jersey City depot, on time to a minute, it was found that the last 31 miles had been made in 36 minutes. What makes the run more remarkable is that the train came to a full stop at Ridgewood and at the tunnel, and slowed up at Rutherford, at the two bridges on the salt meadows, and in the Jersey City yard, so that making allowances for these detentions its time must have been more than a mile a minute.—*Port Jervis Gazette, June* 11.

Prompt Punishment of a Defaulter.

Some time ago the American Surety Co., of New York, issued a bond of $5,000 on John H. D. Meyer, teller of the Pullman Loan & Savings Bank at Pullman, Ill., and having recently suspected him, an investigation was instituted which resulted in the arrest of Meyer for embezzlement. Meyer endeavored to effect his escape by obtaining one Haines, a professional "straw bailer," to execute his bail bond in the name of James Crow, a property owner in Chicago. The American Surety Co., however, at once detected the game, and as soon as the alleged Crow attempted to justify on the bond he was arrested, together with one Palmer, who seems to have arranged the scheme. Meyer pleaded guilty at the trial and was sent to the Joliet penitentiary for three years. For his share in the plot the man Palmer was tried, convicted and sentenced to one year's imprisonment and $500 fine, this trial having had, as Chicago lawyers say, an excellent effect on the straw-bail gang which has infested the cit courts.

The Pullman Loan & Savings Bank, through George M. Pullman, President, subsequently addressed the following letter to the company:

"*American Surety Co.*, 160 *Broadway, New York:*

"Gentlemen—I am pleased to acknowledge receipt of your check for $5,000, on the Bank of North America, New York, in full for claim made to your company under your bond guaranteeing the fidelity of the late teller of this bank, and I beg to add my appreciation not alone of the prompt and satisfactory manner in which you have discharged your obligations to this bank, but also of the admirable manner in which you have acted in discharging the greater obligation to the community by the swift punishment of the defaulter.

"Very truly yours, GEORGE M. PULLMAN, President."

The American Surety Co. has also secured the imprisonment for embezzlement of an agent of the Peoria, Decatur & Evansville road and the Pacific Express Co. on whom its bond was issued.

Caught by a Water Spout.

A correspondent of the Raleigh *News and Observer*, writing from Asheville, N. C., June 9, says: "The most terrific and phenomenal rain that ever fell in the history of this section occurred last night in the vicinity of Marshall. Your correspondent was in the train which left Asheville at 6 o'clock p.m. Two small slides occurred before reaching this place. They were soon removed. The rain descended in torrents, and there was great uneasiness for fear of other troubles on the road ahead. When the train reached a point just below Marshall, a slide in front of the train stopped it. The conductor ordered the train to back to the depot. A mountain torrent, which five minutes before the train had passed over, could not now be crossed. The drift-wood, trees, timbers of houses and bowlders which the raging mad torrent piled upon the track made it impossible for the train to return to the depot. The road-bed is on the margin of the river, and the turnpike road is between the railroad and the mountain. The embankment next to the river began crumbling from underneath and the conductor and passengers fled in consternation from what appeared to be the doomed train. The water was four feet deep on the track and rising at the rate of 6 in. a minute. Heavy logs, 2 and 3 ft. in diameter, were dashed against the cars, and for a few moments the scene was one of the greatest fear and excitement. By the most heroic efforts the construction force got the drift wood and *débris* from the road, which was actually melting away from the cars, and the brave engineer, Mr. Clark, drove through the turbulent water to a place of safety. Captain Murphy, the conductor, says that he never spent a moment in such imminent danger in all his years of railroad life. The stream, which is known as Rigsby's run, is ordinarily not more than 3 or 4 ft. wide. This sudden and unparalleled rise is attributed to a water-spout which broke a short distance above the town of Marshall and was augmented by the heavy rain which was all the while falling in great torrents."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Nashville, Chattanooga & St. Louis, annual meeting, in Nashville, Tenn., Sept. 15. Transfer books closed June 16.

Oregon Railway & Navigation Co., annual meeting, in Portland, Oregon, June 21.

Oregon & Transcontinental Co., annual meeting in Portland, Oregon, June 21.

St. Paul & Duluth, annual meeting, in St. Paul, Minn., June 21.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Lowell, 3 per cent., semi-annual, payable July 1, to stockholders of record on June 12.

Boston, Revere Beach & Lynn, 3 per cent., semi-annual, payable July 1, to stockholders of record on June 19.

Missouri Pacific, 1¾ per cent., quarterly, payable July 1, to stockholders of record on June 19.

New York, Lackawanna & Western (leased to Delaware, Lackawanna & Western), 1¼ per cent., quarterly, payable July 1, to stockholders of record on June 15.

Railroad and Technical Conventions.

Meeting and conventions of railroad associations and technical societies will be held as follows:

The *American Society of Civil Engineers* will hold its annual convention in Denver, Col., beginning on Friday, July 2.

Western Association of General Passenger and Ticket Agents.

The annual meeting was held in Chicago, June 9, Vice-President B. H. Horner in the chair, President J. S. Clark having resigned because of removal to Texas. The chief business considered was rates to land-grant points. The next meeting is to be held in St. Louis Dec. 8.

Baltimore & Ohio Employes' Relief Association.

The March sheet of this association shows payment of benefits as follows: Main Stem, Transportation Department, 148; Machinery Department, 192; Road Department, 77; Baltimore & Philadelphia, 4; Trans-Ohio divisions, 138; Pittsburgh Division, 97; physicians' bills, 225.

The February report of the Savings Fund and Building Feature shows $37,540 cash on hand Feb. 1. Receipts for the month were $18,057, making a total of $55,597. Payments were $15,732, leaving $39,865 on hand Feb. 28. Payments included $6,065 to depositors, $9,633 to borrowers and $34 miscellaneous. The total amount on deposit Feb. 28 was $259,361.

Pennsylvania Railroad Mutual Benefit Association.

The Altoona (Pa.) *Sun* of June 12 says: "The annual meeting of the Pennsylvania Railroad Mutual Benefit Association was held at Derry on Tuesday, delegates representing divisions in Altoona, Conemaugh, Pittsburgh and other places being present. Since the establishment of the Relief Department by the company, the membership of the benefit association has fallen off so that it was thought advisable by many to dissolve the association. At this meeting, however, it was decided to continue the organization, but the sick benefits which have been paid heretofore were abolished, and the entrance fee lowered to $2. The officers were elected for the ensuing year."

Yardmasters' Mutual Benevolent Association.

The twelfth annual convention of the Yardmasters' Mutual Benevolent Association of the United States and Canada assembled in St. Paul, Minn., June 9, President James C. Campbell, of Derry, Pa., in the chair. Prayer was offered by Henry R. Hopkins, of Chicago. Mayor Rice delivered an address of welcome. Greetings were sent to the Train Dispatchers' convention in Chicago. The annual address was delivered by President Campbell. Committees were appointed and the hours for sessions fixed. The membership of the order is now 1,100, and about 120 delegates present.

In the afternoon session the first business was the hearing of the report of the Executive Committee. The report, in referring to the labor troubles, said the association had pulled through the terrible ordeal unscathed, the members having stuck to the companies. The lines have been drawn close, 193 members being dropped for non-payment of assessments. It was recommended that provision be made for reinstatement of members dropped for non-payment of assessments, when caused by sickness, loss of situation, etc.; that a medical examination of applicants is recommended, as there are too many deaths from consumption. The eleventh annual convention instructed the Committee to report on the advisability of obtaining a charter, but the Committee was not in favor of it. The afternoon was spent in discussing the question of incorporation.

On the following day this question was decided in accordance with the Committee's report. Other routine business was transacted in due order.

On Friday, June 11, the meeting closed, and the delegates went on an excursion over the St. Paul, Minneapolis & Manitoba road.

National Association of Railroad Station Agents.

The second annual convention of the National Association of Railroad Station Agents began in Indianapolis with an attendance of 125 members, including J. C. Downing, President, and S. L. Spink, Secretary, the first of Central City, and the second of Princeton, Ky. The association was formed less than eighteen months ago with 99 members, and now has 900 on the rolls. The association now has eight states organized into divisions, and one of the objects of the meeting here is to organize an Indiana division. It is also intended to revise the constitution and discuss measures for extending the organization. The various committees were appointed at the afternoon session, and resolutions were adopted opposing strikes.

On the second day the first important business of the association was the adoption of a plan of insurance proposed by M. M. Kirkman, of Chicago, by which the insurance is reduced from $7.50 to $3.50 on each $1,000. The agents propose to organize a company with $50,000 capital, in which the insured are to be stockholders. At the afternoon meeting officers were elected.

At the evening session the principal subject under discussion was that of extending financial aid to the *Agents' Journal*, the organ of the association, published by Mr. Craft in Indianapolis. A special committee appointed to consider the matter reported in favor of the association buying five shares of the capital stock at $25 per share, but an effort was made to secure an agreement on the part of the association to pay the differences between the receipts and expenses for one year, provided it did not exceed $50 per month. The committee's report was finally adopted. The association adjourned to meet at Minneapolis on the third Wednesday in July, 1887.

American Association of Train Dispatchers.

The American Association of Train Dispatchers began its third annual convention in Chicago, June 8, with an attendance of about 200 members. President John W. Lynahan, of Corning, N. Y., was in the chair, and Secretary and Treasurer E. J. Peabody, of Marion, Iowa, was at his post also. Mayor Harrison in a complimentary speech welcomed the strangers to the city, and President Lynahan responded in modest and grateful language on behalf of the association. The convention was then declared open for the transaction of business, and the first order of the day was to pass upon applications for membership. The names of 247 persons were approved and six were rejected. A recess was taken until 2 o'clock.

After the recess communications of regret from members who were unable to be present were read, also an invitation from the Chicago Board of Trade to inspect the big building. The invitation was accepted, and the convention will visit the board in a body at 1 o'clock Thursday afternoon. An invitation from the Minneapolis & St. Louis Railroad was read offering free transportation to members who desire to return home over that line. The Secretary and Treasurer then read his report, which showed the receipts for 1885 to be $5,240, with a balance of $382 on hand. A committee on credentials was appointed, there being some dissatisfaction regarding the way in which new members had been received in the morning. The motion of the morning was reconsidered and the Secretary instructed to cast the ballots in accordance with the report of the committee on credentials, which was that all credentials handed in were accepted. This was done, and the six names that had been rejected, together with the 247 applications for membership, were elected members of the association. The Association now has a membership of 712.

On the second day proposed amendments to the constitution were considered. An article refusing recognition of local branches was voted down. In the afternoon the members took a short excursion on the lake and a trip to Pullman.

On the third dry officers were elected and the routine business closed up. After the adjournment the members went on an excursion to Minneapolis, over the Chicago, Milwaukee & St. Paul road.

ELECTIONS AND APPOINTMENTS.

American Train Dispatchers' Association.—At the annual convention in Chicago last week, the following officers were elected: President, G. W. Babbitt, St. Thomas, Ont.; Vice-President, F. J. Martin, Olean, N. Y.; Secretary and Treasurer, E. J. Peabody, Marion, Iowa.

Atlanta & Hawkinsville.—Mr. John N. Dunn, of Atlanta, Ga., is President of this new company.

Beaver Falls Marginal.—The office of this new company is in Beaver Falls, Pa.; the directors are John Reeves, Henry W. Reeves, James M. May, George W. Coates, J. F. Merriman, Henry W. Nair, Jacob Henrici and T. L. Hennon, all of Beaver Falls.

Binghamton & Southwestern.—Joseph P. Noyes, Charles A. Whitney, James B. Weed, John Ray Clark, J. Warren, Charles E. Lee and George Whitney, of Binghamton, N. Y., are the directors of this new company, which is to build the New York end of the Williamsport & Northeastern.

Carson & Colorado.—At the annual meeting in Hawthorne Nev., recently, the following were elected: President, H. M. Yerington; Directors, D. A. Bender, D. L. Bliss, Alfred Helm, S. P. Smith, W. D. Tobey, L. H. Wright.

Chicago, Milwaukee & St. Paul.—In Chicago last week directors were chosen as below for the Illinois companies named, which are wholly owned by this company: *Central Illinois & Wisconsin.*—John W. Cary, Ralph Emerson, Roswell Miller, Alexander Mitchell, E. Walker. *Chicago, Milwaukee & St. Paul, of Illinois* —John W. Cary, Ernest Carter, Leslie Carter, Roswell Miller, Alexander Mitchell, E. S. Wadsworth. *Chicago & Pacific.*—John W. Cary, Ernest Carter, Leslie Carter, Roswell Miller, Alexander Mitchell, T. W. Wadsworth, E. Walker.

Chicago, Rock Island & Pacific.—Mr. F. M. Gower is appointed General Agent of the Freight Department at Kansas City, the position being a new one. He will be in charge of business at Kansas City, Atchison, Leavenworth and St. Joseph, and in Kansas, New Mexico and such portions of Nebraska as are tributary to Leavenworth and St. Joseph. Mr. Gower was formerly General Freight Agent of the St. Joseph & Grand Island road. F. M. Day is appointed Traveling Freight Agent of the Southwestern Division at Trenton, Mo., vice J. E. Conklin, resigned.

Cincinnati, Hamilton & Dayton.—At the annual election, June 15, Augustus S. Winslow, George Hoadly, C. C. Waite,

of Cincinnati; Christopher Meyer, William A. Proctor, Alexander McDonald, George H. Stayner, Eugene Zimmerman and Henry S. Ives were chosen directors, all being new directors, except Messrs. Waite, Proctor and Winslow, and succeeding Hugh J. Jewett and associates.

Gen. H. Stayner, New York, was chosen President; Henry S. Ives, of New York, C. C. Waite and Eugene Zimmermann, of Cincinnati, Vice-Presidents; E. Wilson Woodruff, Secretary, and F. H. Short, Assistant Secretary and Treasurer.

Columbus & Maysville.—At the annual meeting in Winchester, O., June 1, the following directors were elected: J. H. Thompson, C. T. Bell, L. S. Smith, John Strain, J. H. Richards, Hardin Roads, W. R. Smith. The directors elected J. H. Thompson, President; John Strain, Vice-President; W. R. Smith, Secretary.

Joliet, Aurora & Northern.—At the first annual election, June 7, at Joliet, Ill., Mr. P. B. Shumway was elected President; Daniel Robertson, Vice-President; H. H. Evans, Treasurer; and M. R. Wood, Secretary. Directors, P. B. Shumway, Evanston, Ill.; H. H. Evans, Aurora, Ill.; M. R. Wood, Plainfield, Ill.; Daniel Robertson, Joliet, Ill.; John M. Hamilton, Chicago.

Louisville & Nashville.—Mr. B. F. Dickerson is appointed General Land Agent, with office in Birmingham, Ala., in place of Mr. R. W. A. Wilde, resigned.

Master Car-Builders' Association.—At the convention last week the following officers were chosen: President, B. K. Verbryck, Chicago, Rock Island & Pacific; Vice-Presidents, Wm. McWood, Grand Trunk; John W. Cloud, Pennsylvania Railroad; E. W. Grieves, Baltimore & Ohio. Treasurer, John Kirby, Lake Shore & Michigan Southern. Executive members for two years, F. D. Adams, Boston & Albany; L. Packard, New York Central & Hudson River; E. B. Wall, Pittsburgh, Cincinnati & St. Louis.

After the adjournment the Executive Committee met and re-elected Mr. M. N. Forney Secretary.

Milwaukee, Lake Shore & Western.—At the annual meeting in Milwaukee, June 9, the old board was re-elected as follows: F. W. Rhinelander, Samuel S. Sander, Charles Dana, Joseph R. Busk, Henry B. Hammond, W. K. Howman, Gordon Norrie, New York; Charles G. Ramsey, Norfolk, Va.; D. P. Seller, London; D. Parrish, Philadelphia; Joseph Vilas, Charles Luling, Manitowoc, Wis.; James H. Mead, Sheboygan, Wis. The old board of officers were re-elected: F. W. Rhinelander, President; Joseph R. Busk, Vice-President; Gordon Norrie, Treasurer; Alfred L. Cary, Secretary and General Solicitor; H. F. Whitcomb, General Manager.

Milwaukee & Northern.—At the annual meeting in Milwaukee, Wis., June 7 Charles Ray, of Milwaukee, was elected a director, and Ephraim Mariner and J. C. Spencer were re-elected. All the old officers were re-elected.

Minnesota & Northwestern.—At the annual meeting in St. Paul, Minn., June 2, three directors were re-elected as follows: C. F. Benson, Sibley, Ia.; C. Livingston, R. A. Smith, St. Paul.

Mobile & Ohio.—Mr. M. English is appointed roadmaster of the northern division in place of Mr. W. H. Wells, resigned. Mr. Wm. T. Gould is appointed assistant engineer of the northern division.

National Association of Station Agents.—At the convention in Indianapolis last week this Association elected the following officers: President, Geo. Petry, Shelbyville, Ky.; Vice President, G. F. Talmadge, Hastings, Minn.; Secretary, O. L. Rickard, Merrillan, Wis.; Treasurer, G. L. Spink, Princeton, Ky. An Executive and Guarantee Committee were also appointed and Minneapolis selected for the next meeting, July, 1887.

Newport News & Mississippi Valley.—Mr. John Muir is appointed General Traffic Manager of this company's lines, as well as of the Chesapeake & Ohio road. Office in New York.

Pennsylvania Company.—At a directors' meeting, June 15, Geo. B. Roberts was re-elected President; J. N. McCullough, First Vice-President; Wm. Thaw, Second Vice-President; Thos. D. Messler, Third Vice-President and Comptroller; S. B. Liggett, Secretary, and Stephen White, Jr., Assistant Secretary.

Pennsylvania Railroad Mutual Benefit Association.—At the annual meeting last week the following officers were chosen: President, Jacob Weidman; Vice-Presidents, J. K. Russell, J. C. Layton and J. Walters; General Secretary, J. H. Gillespie; Treasurer, D. O. Shaver. This is an old organization and has no connection with the company's new Relief Department.

St. Louis, Alton & Terre Haute.—At the annual meeting in St. Louis, June 7, the old directors were re-elected, as follows: Edward Abend, Henry A. Beach, M. Bayard Brown, W. Bayard Cutting, Levi Davis, James A. Eads, F. C. Hollins, Wm. K. Murphy, George W. Parker, H. C. Stimson, Wm. A. Wheelock, Eli Wiley, F. M. Youngblood. The board re-elected W. Bayard Cutting, President; George W. Parker, Vice-President, General Manager and Treasurer; E. F. Leonard, Secretary.

St. Louis, Kansas City & Colorado.—The new board has elected officers as follows: President, L. M. Potter; Vice-President, E. H. Brown; Secretary, C. H. Osborne; Chief Engineer, S. T. Emerson. General offices, St. Louis.

Southern Pacific Co.—Mr. E. G. Thompson having resigned as General Superintendent of the lines of the Atlantic System west of Lafayette, La., that office will be abolished after June 15. Communications heretofore addressed to the General Superintendent will be addressed to W. Irwin, Master of Transportation, whose office will be moved from Houston to New Orleans.

Toledo, St. Louis & Kansas City.—The directors of this newly organized company, succeeding the Toledo, Cincinnati & St. Louis, are: James M. Quigley, I. W. White, R. G. Ingersoll, New York; Clarence Brown, Fred. L. Geddes, C. L. Luce, Toledo; Henry A. Neal, A. H. Chapman, Wm. D. Patton, Charleston, Ill.; Gen. L. Bradbury, W. S. Push, Henry C. Parker, Oscar W. Bell, Peoria, Ill. President, James M. Quigley; Secretary and Treasurer, I. W. White.

Mr. Robert G. Ingersoll, of New York, has been chosen President of this company, successor to the Toledo, Cincinnati & St. Louis.

Wabash, St. Louis & Pacific.—General Manager A. A. Talmage issues the following circular: The office of Superintendent of Transportation is hereby abolished. Mr. K. H. Wade is appointed General Superintendent, in charge of Transportation Department and Maintenance of Property, with headquarters at St. Louis, Mo."

Mr. Wade issues the following: "Having been appointed General Superintendent, the jurisdiction of G. W. Stevens, Superintendent of Eastern Division, is hereby extended to include the Middle Division, with headquarters at Decatur, Ill. M. H. L. Magee is hereby appointed Superintendent Western Division, with headquarters at Moberly, Mo., vice R. G. Butler, resigned. Mr. C. B. Adams is hereby appointed Car Service Agent, with headquarters at St. Louis. He will have charge of distribution of cars as between divisions, and will perform such other duties as may be assigned him by this office."

Western Association of Passenger and Ticket Agents.—At the annual meeting in Chicago, June 9, B. F. Horner (New York, Chicago & St. Louis), was chosen President; W. S. Baldwin (Louisville, New Albany & Chicago), Vice-President; J. E. Hannegan (Burlington, Cedar Rapids & Northern), Secretary.

Yardmaster's Mutual Benevolent Association.—At the convention in St. Paul last week, the following directors were chosen: President, E. M. Carter, of Wilmington, Del; Vice Presidents, J. J. Bresnaban, of Denver, and Thomas Gresham, of Atlanta; Secretary and Treasurer, Joseph Panger, of Altoona; Corresponding Secretary, William Baird, of Philadelphia; Sergeant-at-arms, T. J. Fanning, of Palestine, Texas; Executive Committee, J. Q. Hicks, Indianapolis; G. J. Johnson, LaCrosse; Justus Hohl, Kansas City; J. Gould, Trenton; S. N. Anderson, Altoona; A. J. Flint, Minneapolis; S. F. Randall, Louisville.

PERSONAL.

—Mr. R. G. Butler has resigned his position as Superintendent of the Western Division of the Wabash, St. Louis & Pacific road.

—Mr. J. H. Tinney has resigned his position as Assistant Superintendent of the Chicago & Atlantic, and it is said that the place will not be filled.

—Mr. E. G. Thompson has resigned his position as General Superintendent of the Texas lines included in the Southern Pacific Co.'s Atlantic system.

—Mr. S. L. Coppedge, Chief Engineer of the Ottawa, Osage City & Council Grove road, was killed in an accident on that road near Osage City, Kan., June 9, the car in which he was riding having been thrown from the track.

—The Birmingham (Ala.) *Labor Union* says that George A. Schele, of that city, is about to sail for South Africa, where he is to be Principal Assistant Engineer of the Transcontinental Railway, and that he will be accompanied by Thomas O'Brien, another civil engineer.

—The Utica *Observer* says that Mr. Charles Hewes, of the New York Central, who went but a few weeks ago with five other men to take places as conductors on the Panama Railroad, returned last week the sole survivor of the six, the others having died of the deadly fever of the country.

—Rev. Thomas K. Beecher, of Elmira, N. Y., addressed Order of Railroad Conductors and the Brotherhood of Locomotive Engineers at a joint picnic which they held at Portage, N. Y., last Wednesday. His brother, Henry Ward Beecher, had accepted an invitation to make the address, but sailing for Europe this week was obliged to recall his acceptance.

—Engineers throughout the country are familiar with the name of D. Van Nostrand, as one of the leading publishers of engineering books in America. During the war he was still more widely known as the chief publisher of military works, for which at that time there was, of course, an enormous demand. Mr. Van Nostrand died June 14 last at his home in New York, at the age of 75.

—Mr. John Townsend, for 25 years Master Carpenter of the Lake Shore & Michigan Southern road, was found dead in his berth in a sleeping car on that road on its arrival at Chicago, June 5. Mr. Townsend lived at Adrian, Mich., of which city he had been Mayor and was a highly esteemed citizen. He was 70 years old on the day of his death, which is supposed to have been caused by heart disease.

—Mr. Walter Dawson, Master Mechanic of the main line of the Delaware, Lackawanna & Western road, having received leave of absence for a year in order that he may recruit his health, the employés in the Scranton shops last week presented him with a handsome diamond stud and a gold-headed cane, as a token of their esteem. At the same time the locomotive engineers and the men in the Great Bend shops presented him with a valuable gold medal. Mr. Dawson sails from New York June 15, and expects to spend most of his vacation in Europe.

—Mr. J. Dutton Steele died at his residence in Pottstown, Pa., June 13. He was born in Chester County, Pa., on March 18, 1810, and when 18 years old joined a corps of engineers employed on the state canals. Then he entered the employ of the Baltimore & Ohio Railroad and for 10 years was engaged in the construction of that road. In 1840 he purchased a farm at Downington, Pa., and for six years engaged in agricultural pursuits. On Jan. 1, 1847, he entered the service of the Philadelphia & Reading Railroad Co. and served for 20 years in the several capacities of Chief Assistant Engineer, Chief Engineer and Vice-President. He was the first to adopt wrought-iron girders for short span bridges. In 1867 he severed his connections with the Reading and accepted the Presidency of the Sterling Iron & Railway Co. of New York, removing to Brooklyn. During the three years that he was connected with this company he developed valuable iron ore lands in Orange County and made explorations for railway construction in the states of Michigan, Wisconsin and Minnesota. He took a prominent part in the organization of the American Society of Civil Engineers and was a member of the commission appointed to examine the plans of John A. Roebling for the Brooklyn Bridge. In 1870 he returned to Pottstown and afterward was engaged in the construction of several small railroads. In 1880 he organized the J. D. Steele & Son Manufacturing Co., at Pottstown, and six weeks ago, on account of failing health, wound up the business. Two sons and three daughters survive him.

TRAFFIC AND EARNINGS.

Chicago Lumber Traffic.

The receipts and shipments for the first four months of this year are reported as follows by the *Northwestern Lumberman*, in *thousands* of feet:

	1886.	1885.	Increase.	P.c.
Receipts	176,841	101,404	75,437	74.5
Sales and shipments	491,318	390,585	100,733	25.8

The receipts are not particularly significant, because navigation was open much longer this year than last, but the sales show unmistakably a largely increased demand compared with last year, when it was light until later in the season.

Transcontinental Business.

A dispatch from Chicago, June 13, says: "The three arbitrators, E. B. Thomas, Hugh Riddle and E. P. Vining, who for the past few days have been hearing both sides in the controversy between the Atlantic & Pacific and the Southern Pacific companies, growing out of the transcontinental war, rendered their decision yesterday. It sustains the Atlantic & Pacific, holding that the latter has the right to make any rate that may be made by any other through line, and such rates are to be divided *pro rata* between the Southern and the Atlantic & Pacific. It is believed that this decision will aid in settling the transcontinental dispute."

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885	Inc. or Dec	P. c.
Five months to May 31:				
Cin., W. & Balt.	$764 016	$720,269	I. $43,747	6 1
Cleve., Ak. & Col.	194.000	187,065	I. 6,943	3 7
Col., H.Vy. & Tol.	866,581	8 9,059	D. 12.478	1.4
Den. & R. G. W..	365,038	342.116	I. 22.922	6 7
Grand Trunk.....	6,130.197	5,731,356	I. 398.841	7.0
Gulf, Col. & S. F.	746 385	472 878	I. 273,507	5.8
Ind., Bloom. & W.	934,064	893,658	I. 40,406	4.5
Ind., Dec & Spr..	151.844	128,210	I. 23.634	18 4
Marq., H. & Ont.	240 590	159,589	I. 81.001	50.8
Nash., C. & St. L.	902,670	879,518	I. 23,152	2.6
Net earnings...	341,988	350.176	D. 8,188	2 3
Ohio Southern....	192,892	174,900	I. 17,992	10.3
Rich. & Dan.	2,979,731	2,960,921	I 18 810	6 4
St. Jo. & Gd. I ..	458,634	425.217	I. 33,419	7.9
Texas & St. L. .	574.374	368,311	I. 206,063	56.0
Wisconsin Cent...	559 795	589,656	D. 29,861	5 1
Month of May:				
Cairo, V. & C....	$55,237	$38 048	I. $17,189	45.1
Cin., W. & Balt..	144,715	119,975	I. 24,740	20.6
Cleve., Ak. & Col.	43.065	40,590	I. 2,475	6.1
Col., H.Vy. & Tol	174,930	167.941	I. 6,989	4.2
Den. & R. G. W..	78 945	78,445	I. 500	0.6
Grand Trunk....	1,228,681	1,09.,198	I. 134,483	12.3
Gulf, Col. & S. F..	153,000	116,103	I. 36,897	31 8
Ind., Bloom. & W.	180,686	160,607	I. 20,079	12 5
Ind., Dec. & Spr..	26,867	23,122	I. 3,745	16 2
Ind. & St. L.....	98,198	78,931	I. 19 267	24 4
Ma q., H. & O....	130,651	75,282	I. 55,369	73.5
Nash., C. & St. L.	172,329	167.495	I. 4,834	2.8
Net earnings..	61,280	65,996	D. 4,716	7.1
N. Y., Ont. & W.	105,716	102,654	I. 3,062	3 0
Ohio Southern....	31,159	31,845	D. 686	2.1
Rich. & Dan....	501,516	529,756	D. 28,240	5 3
St. Jo. & Gd. I...	89,408	63,356	I. 26,052	4.1
Texas & St. L...	93,272	61,757	I. 31,515	51.0
Wisconsin Cent..	114,646	120,062	D. 5,416	4.5
First week in June:				
Buf., N. Y. & Ph.	$51,000	$47,000	I. $4,000	8.5
Buff, Roch. & P..	13 256	24,993	D. 11,737	47 0
Bur., C. R. & No.	72.461	78,740	D. 6,279	8.0
Canadian Pac....	201,000	159,000	I. 42,000	26.4
Central Iowa....	22,528	19,344	I. 3,184	16.5
Chi. & Alton....	136,573	131,428	I. 5,145	3.9
Chi. & East. Ill..	32,731	30,304	I. 2,427	8.0
Chi., Mil. & St. P.	466 000	433 921	I. 29,079	6.5
Chi. & N. W.	488,600	436,200	I. 52,400	12.0
Ch., St. P., M. & O.	110,300	109,500	I. 800	0.7
Chic. & W. Mich..	26,677	25,641	I. 1,036	4.0
C., I., St. L. & C..	46,253	41,500	I. 4 753	11.4
Den. & R. G.....	112,631	111,892	I. 739	0.7
Det., Lan. & No..	19,583	20,647	D. 1,064	5.1
Grand Trunk....	316,222	274,092	I. 42,130	15.4
Ill. Central.....	186,800	204,941	D. 18.141	8.8
Iowa lines.....	32,000	29,879	I. 2 121	7.1
Long Island.....	72,171	69,554	I. 2,617	3.8
Louisv. & Nash..	245,345	251,376	D. 6,031	2.4
Mexican Central..	61,400	62,072	D. 672	1.1
Mil., L. S. & W.	51,100	22,460	I. 28.640	12.7
Mil. & Northern.	10,465	11,324	D. 859	7.6
N. Y., Ont. & W..	24,997	24,646	I. 351	1.4
Norfolk & West..	43,452	44,279	D. 827	1.9
Oreg. R. & N.....	96,045	76 852	I. 19,193	25.0
St. L. & San F...	75,200	67,300	I. 7,900	11.7
St. P. & Duluth..	35,197	28,785	I. 6,412	22.3
Wab., St. L. & P..	227,000	174,000	I. 53,000	30.5
Second week in June:				
Denver & R. G ...	123,065	109,780	I. 13,285	12.1
Mil., L. S. & W..	53,565	23,335	I. 30,230	129.6

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Coal.

Coal tonnages for the week ending June 5 are reported as follows:

	1886.	1885.	Inc. or Dec.	P.c.
Anthracite.....	509,360	617,767	D. 108.407	17.5
Eastern bituminous....	217,262	241.119	D. 23,857	9 9
Coke.....	77,667	47,272	I. 30,695	65.3

The anthracite market is in fair condition, and stocks are not increasing. An increased demand from the blast furnaces is reported.

Cumberland coal shipments for the week ending June 5 were 69,678 tons. Total to June this year, 528,172; last year, 1,117,274; decrease, 589,102 tons, or 52.7 per cent.

Cotton.

Cotton movement for the week ending June 11 is reported as follows, in bales:

	1886.	1885.	Inc. or Dec.	P. c.
Interior markets:				
Receipts.....	11,036	4.851	I. 6,185	127.5
Shipments.....	31,970	9,091	I. 22,879	251.1
Stock, June 11....	118,907	47,701	I. 71,206	147.3
Seaports:				
Receipts.....	22,773	4.729	I. 38,044	804.3
Exports.....	81,285	27,473	I. 53,812	195.7
Stock, June 11.....	443,977	385,756	I. 58,221	15.1

The total shipments from plantations for the crop year to June 11 are estimated at 6,408,057 bales, against 5,588,824 last year, 5,615,954 in 1883–84, and 6,878,751 in 1882–83.

Lake Superior Iron Ore Shipments.

Up to June 14 these shipments, including Ashland and Two Harbors, which are sending much more than heretofore, amounted to about 650,000 tons for the season, which is twice as much as last year, when, however, the season began about 10 days later. The shipments from Ashland come from the Gogebic range on the line of the Milwaukee, Lake Shore & Western, 45 to 80 miles east of Ashland, and give that road a heavy traffic on that end of its line, such as a new railroad rarely secures.

New England Traffic Notes.

The New England Clearing House reports a total of 43,041 loaded cars coming into New England at all points during May, against 34,363 in May of last year, an increase of 8,678 cars, or 25.2 per cent.

Indianapolis Car Movement.

The number of cars received and forwarded at Indianapolis has been:

	Week ending—				
	May 15.	May 22.	May 29.	June 5.	June 12.
1886—Total..	10,375	18,796	18,950	18,588	18,587
Loaded	12,848	14,436	14,321	13,866	13,735
1885—Total	17,547	16,975	18,271	18,750	.....
Loaded.	13,156	12,848	13,845	14 321	.....

An increase last week is noted in the east-bound movement of corn and flour and in lumber, and a decided increase in live stock, but a decrease in west-bound shipments.

Chicago Traffic Notes.

The Chicago & Northwestern has been sued for $10,000, for refusing to carry beer for some liquor sellers in Marshalltown, Iowa, the laws of that State making it a penal offence

to carry beer or liquors into it without a permit from the Auditor of the county to which it is consigned.

Last Saturday, at Chicago, it was agreed to reduce the rate per single-deck car of sheep coming from Texas to $17 from Mississipi River points, provided the Missouri Pacific would reduce the rate from Texas to $98 for double-deck cars. Sheep have been starving to death in Texas, in consequence of a 13 months' drought.

Commissioner Geo. H. Daniels, of the Central Passenger Committee, has issued a circular to connecting lines containing the resolutions of the committee condemning the running of cheap excursions for land-buyers or others to points outside of the territory of the committee, and requesting those lines northwest and southwest of that territory not to advertise such excursions along the lines of members of the committee.

The Hannibal & St. Joseph and the Chicago & Alton have given the required 30 days' notice of withdrawal from the Chicago, St. Louis & Missouri River Passenger Association, which covers much the same field for passengers as the Southwestern Association does for freight.

Central Traffic Association.

The Executive Committee met last Wednesday in Chicago to consider the following subjects submitted by Commissioner Blanchard :

First—To confer with representatives of the Western roads concerning the Mississippi River per cents., which are the subjects of difference between the majority and minority reports of the Percentage Committee, more especially that portion of the same involving Mississippi River per cents. eastward.

Second—To decide upon the manner of including in the Chicago, Peoria & St. Louis pools the traffic recently agreed to be covered thereby.

Third—To receive Mr. Blanchard's report upon the results of negotiations with President Benedict of the Chicago & Atlantic Railroad.

Fourth—To consider the question of the division of the duties and expenses between the New York and Chicago offices.

Fifth—The consideration of a report as to the condition of the St. Louis and Peoria pools.

Sixth—Any other questions pertinent to the business and objects of the Association.

Transcontinental Traffic Notes.

Mr. C. P. Huntington contradicts a report of an immediate settlement of the transcontinental railroad war, but says that something may be done in the course of two or three weeks.

The representatives of the transcontinental lines at San Francisco have agreed that they will pay no more commissions on passenger business from San Francisco to points east of Ogden, Deming and El Paso. The agreement was signed by D. W. Hitchcock, of the Union Pacific, T. H. Goodman, of the Central Pacific, W. W. Rank, of the Denver & Rio Grande, H. H. Smith, of the Burlington & Missouri, and W. D. Sanborn, of the Texas Pacific. Overland rates advanced $5 in consequence of the action taken.

RAILROAD LAW.

Injury to Passenger—Negligence.

In the case of Smith against the Central Railroad & Banking Co., the Georgia Supreme Court holds as follows:

In an action against a railroad for damages on account of a personal injury, where the negligence of the defendant, if there was any at all, seems to have been but slight, and that of the plaintiff appears to have been greater, a verdict in favor of the plaintiff for $10,000 is not only flagrantly extravagant, but so excessive as to disclose either bias in his favor or prejudice against the defendant, or that the jury wholly mistook and misapprehended the instructions given to them by the Court, and a new trial is required.

A party who makes an arrangement to be carried on a freight car impliedly agrees to accept and be satisfied with such accommodations, as regard carriages and seats and places of entering and leaving the carriages, as may be found in the usual course of the business. If the cars, at the time of agreeing to his passage and taking his seat, are at a freight depot, he should be satisfied with such means of entering them as are provided for the loading of freight. If the cars are at the time standing on a part of the track, where there is no provision for landing or receiving either goods or passengers, he should be satisfied with such means and facilities as may casually be within his reach. The company is not bound in either case to make landings or any provision whatever for the reception or discharge of passengers where none are expected to be.

Collecting Excess Fares—Duty of Passenger to Buy Ticket.

The Kansas Railroad Commissioners have made the following answer in a case submitted to them by the General Passenger Agent of the Kansas City, Fort Scott & Gulf road:

"The circumstances recited as an example upon which our opinion is desired are stated thus: 'A passenger without ticket takes the train at a point on our main line to a point on branch, the journey being included in the run of two conductors. For instance: A passenger takes the train at Clarksburg, on the main line, for Mulberry, a station on the Cherryvale Division. The main line takes him to Arcadia, the conductor collecting excess. At Arcadia the passenger takes the train on the Cherryvale Division, and the conductor on that train collects excess from Arcadia to Mulberry.'

"The question is whether it it legal to collect the excess fares, assuming the ticket offices are open and passengers can purchase tickets at either Clarksburg or Arcadia.

"We are of the opinion that the proper course to pursue is for each conductor to collect the excess due upon the cash fare paid to him. That this construction of the law would be correct is obvious from two considerations: First—The conductor collecting the first fare to the end of his run, or to a station on another division to which his run does not extend, cannot anticipate that the passenger will not purchase a ticket at the station where he takes a train on such other division, and thus save a portion of the excess he would otherwise have to pay. This is a right the passenger may avail himself of, and of which the conductor may not deprive him. Second—The conductor is not vested with the right to sell tickets, but to collect fares, either in tickets or cash, covering the distance of his run, but if he collected excess beyond his division he must necessarily give the passenger a ticket or other token showing such a payment. It would not be reasonable to require railroad companies to make ticket agents of the conductors.

"Another question submitted for our consideration and opinion is thus stated : 'At a few of our very small towns where a station building is not justified, we have a platform where trains stop and tickets are sold in a building most convenient to the platform, usually a store. Is it legal to collect excess fares from passengers taking the train at such station?'

"If the store where tickets are sold is at an inconvenient distance from the depot, or if it was not publicly known that the store was used for the ticket station, and that tickets were for sale there, it would not be legal to charge excess fare of those who failed to purchase tickets. People are not bound to hunt for tickets in unusual places, but if said store or ticket station is near the platform and easy of excess, and the sale of tickets is open and notorious, it would be, in our opinion, the duty of the persons to purchase ticketsthere to avoid the excess charge on the train."

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe and St. Louis & San Francisco.—It is reported that a very close union is to be made between these two companies, so that the latter will become the Atchison's outlet to St. Louis, and it may be presumed that this will prevent the Atchison building a line to Chicago north of the Missouri River, as has been threatened. The St. Louis & San Francisco under the arrangement is to extend its Ft. Smith Branch across Indian Territory to a connection with the Gulf, Colorado & Santa Fe, the Atchison's latest acquisition at Paris, Texas, which will make a line to compete with the Missouri Pacific, and it is said that the two companies will unite in a guarantee of 4 per cent. interest on the $16,000,000 of first-mortgage (6 per cent) bonds of the Atlantic & Pacific, whose stock they own, if the bondholders will consent to such a reduction of the interest. Such an arrangement ought to increase immensely the traffic passing over the St. Louis & San Francisco, but it will have a tendency to decrease that of the railroads from Chicago to Atchison and Kansas City, as it will be for the interest of the joint companies to go as far as possible over their own line, that is, to St. Louis, rather than to Chicago via Kansas City or Atchison.

Atlanta & Hawkinsville.—This company has been organized to build a railroad from Atlanta, Ga., to Hawkinsville, about 125 miles. At Hawkinsville connection will be made with steamboats on the Ocmulgee River. A proposition has been received from H. L. Collier, of Atlanta, to build and equip the road as a line of 3 ft. gauge for $6,500 per mile.

Beaver Falls Marginal.—This company has been organized to build a branch line from Beaver Falls, Pa., to a junction with the Pittsburgh & Western road in Wayne township. The road will be 9½ miles long.

Broadway & Seventh Avenue.—At the election June 14, the control of this street railroad company (which is the lessee of the railroad in Broadway, the franchise for which was recently repealed by the Legislature because of bribery in obtaining it) was transferred to Philadelphia men who have great street railroad interests in Philadelphia and elsewhere, having recently bought a controlling interest in the North Chicago Railway. The principals among them are P. A. B. Widener and W. L. Elkins.

Burlington, Cedar Rapids & Northern.—A contract has been let to P. B. Winston & Co., of Mitchell, Dak., for the building of an extension of this company's Cedar Rapids, Iowa Falls & Northwestern line from its present terminus to Sioux Falls, Dak. Work is to be begun at once.

Central, of New Jersey.—It is stated that the directors have prepared a plan for putting this company's finances in good condition. It has not yet been made public, but its essential features are said to be the issue of general mortgage bonds to the amount of $10,000,000, some of which will bear 4 and some 5 per cent. interest. These bonds are to be used to retire the floating debt, the adjustment bonds and the stock of the leased lines which can be called in, and also other issues of bonds bearing higher rates of interest. The bonds will be issued as they can be used.

Central Transportation Co.—This company brought suit in the United States Court in Philadelphia June 16 against Pullman's Palace Car Co. to recover $132,000 claimed as due for six months' rent under the lease of 1870. The modified lease was offered in evidence by the defense, and evidence was taken as to the validity of that lease. The case was not concluded as we go to press.

Chenango & Allegheny.—John M. Shedd, of Cleveland, O., as trustee of the mortgage for $1,000,000, has filed a bill in the United States Court at Cleveland for foreclosure, and asked for the appointment of a receiver, and Henry Rawle, trustee of another mortgage, has filed a similar bill.

Chicago, Burlington & Northern.—The report of track laid for the week ending June 5 is as follows :

	Miles.
Newport north	4.648
" south	0.095
La Crosse south	4.591
East Dubuque north	2.007
" south	1.289
Savanna north	0 758
" east	3.561
Oregon west	0.322
Total	17.271

There were laid also during the week 5,171 ft. permanent and 2,535 ft. temporary sidings, making a total of 18.049 miles for the week. The total track laid on main line up to June 5 was 197.310 miles, showing an increase of 19.460 miles over the last report.

The reports of tracklaying on this road are showing some very creditable work on the part of the construction force.

Chicago, Burlington & Quincy.—This company has let contracts for the grading of a new branch from Galesburg, Ill., to Rio, a distance of 12 miles. This line will shorten considerably this company's connection between Peoria and Rock Island, and can also be used to shorten the line from Rock Island to St. Louis. The work is to be done by September next.

Chicago & Northwestern.—The Marquette *Mining Journal* says that this company will begin at once to construct a branch from Metropolitan to Republic, 30 miles, in the Northern Peninsula of Michigan, expecting to have it done in time to ship ore this season. The Milwaukee & Northern has projected a line to Republic.

Cincinnati, Hamilton & Dayton.—In Cincinnati, June 14, the Superior Court decided that the contract of stockholders of this company, whereby they surrendered stock to certain trustees, receiving therefor trustees' certificates, and gave an irrevocable proxy to the trustees to vote at all elections, was valid, except that part which made the proxy irrevocable. Upon the decision being given, Albert Netter and others holding trustees' certificates, moved for a mandatory injunction to compel the trustees to vote according to the wishes of the stockholders. The motion was denied.

The trustees are H. J. Jewett, A. S. Winslow and Cassimir Werk. The suit was brought in the interest of a New York syndicate which had purchased a majority of the whole stock, but a large part of their purchase was stock for which the trustees held proxies. After the decision this syndicate protested against the trustees voting its stock, which left them able to vote only about two-fifths of the whole, which, however, would be a majority of the stock that could vote at the election the next day. Thereupon the New York syndicate, represented by H. S. Ives & Co., of New York, and Albert Netter & Co., of Cincinnati, purchased nearly all the remainder of the trustee stock, until they had 32,496 shares out of the entire 35,000 of the company, paying, it is said, 147 for it. The company has paid 6 per cent. dividends for the last three years, and it has a certain importance as affording an entrance into Cincinnati for other railroads.

At the election the next day only two of the old board of nine directors were retained, Mr. C. C. Waite, who has been the Vice-President and active executive officer, and Mr. A. S. Winslow, of Cincinnati.

The report for the year ending March 31, submitted at the meeting, showed :

	1885-86.	1884-85	1883-84.
Gross receipts	$2,857,359	$2,865,933	$3,082,461
Expenses	1 814,699	1,841,271	2,083,705
Net	$1 042,660	$1,024.662	$998,756
Fixed charges	622,738	645,923	648,040
Dividends	236,940	236,940	236,485
Surplus	$182,982	$141,789	$73,232

The surplus last year was equal to $5.22 per share of common stock, and to $4.63 per share of all the stock.

Mr. Eugene Zimmerman, a director, and said to be one of the principal stockholders since the purchase on Monday, is reported as saying that the policy of the road would not be changed; that it would not become a part of the Huntington system, though it would be operated in harmony with that system. To this end the bridge over the Ohio River would be pushed to early completion.

Cleveland & Canton.—This company has filed its answer to the complaint of Benjamin Cook, under which the injunction was granted restraining the company from electing directors unless the common stockholders were allowed to vote. The answer sets forth the circumstances of the reorganization agreement, under which the common stockholders were allowed to retain an interest in the property, on condition that the preferred stock should have the exclusive right of electing directors for a specified period, and claims that such an agreement was authorized by law and that Mr. Cook accepted his stock with full knowledge of such agreement, and is therefore estopped to set the agreement aside.

Delaware, Lackawanna & Western.—It having been reported that this company was surveying for an extension from Buffalo to Chicago, Mr. Samuel Sloan, President of the company, denied that there was the smallest foundation for the report. "We have no surveying party in the field," he said, "and we have no idea of extending our line to Chicago or anywhere else. As President of this company I shall always follow the orders of the directors so far as I am able to do so, but I am unalterably opposed to increasing the company's obligations by leasehold or otherwise. It is our fixed determination not to add to our present debt. We are well treated by our western connections, the Lake Shore, 'Nickel Plate' and Michigan Central, and we cannot complain of them." In regard to the rumor that the company was trying to secure control of the "Nickel Plate" he added: "That's bosh, just like the other report. We do not care to go beyond Buffalo, and, as I said, will not increase our obligations on any account."

Fremont, Elkhorn & Missouri Valley.—The grading of the Black Hills Branch from Chadron, Neb., to Rapid City, Dak., will be finished by June 15 and the track will probably all be laid by July 1 next. It has been laid now 30 miles north from last year's terminus at Buffalo Gap to Hermosa. It is expected that the grading on the main line west from Chadron will be done as far as Fort Fetterman, Wyo., 140 miles, in July next and the track will be laid that far by Sept. 1 or sooner. Mr. C. P. Treat, the contractor for this work, has now at work about 1,300 teams and 2,000 men. A good deal of the work has been heavy, running from 30,000 to 150,000 yards per mile and with considerable rock. About 5,000 pounds of rackarock have been used, with good result. The company is getting a very good line, the maximum grade to Fort Fetterman being 1 per cent., and the curvature light.

Grand Rapids & Indiana.—The work of grading the new extension from Grand Rapids, Ind., to Muskegon was begun last week at both ends of the line. The contract provides for the completion of the road by Dec. 31 next.

Grand Trunk.—The statement for April and the four months to April 30 is as follows :

	April.		Four months.	
	1886.	1885	1886.	1885.
Earnings	£64,009	£245,473	£1,000 327	£947,469
Expenses	181,294	185,264	744,075	768,983
Net earnings	£82,715	£60,209	£256,252	£178,506

For the four months the gross earnings increased £52,838, or 5.6 per cent., and the expenses decreased £24,908, or 3.2 per cent., the result being a gain of £77,746, or 43.4 per cent., in net earnings.

For the four months the statement for the controlled lines west of Detroit is as follows :

	C. & G. T.		D. G. H. & M.	
	1886.	1885.	1886.	1885.
Earnings	£192,510	£189,262	£77,394	£65,848
Expenses	159,684	164,297	59,933	53,945
Net earnings	£32,826	£24,905	£17,461	£11,903

The Chicago & Grand Trunk shows an increase of £3,308, or 1.7 per cent. in gross earnings, and of £7,921, or 31.7 per cent. in net earnings. The Detroit, Grand Haven & Milwaukee shows an increase of £11,546, or 17.8 per cent. in gross earnings, and of £5,558 or 46.3 per cent. in net earnings.

Gulf, Colorado & Santa Fe.—At the stockholders' meeting in Galveston, June 16, it was voted to increase the capital stock from $7,000,000 to $10,000,000. The statement of the business of 1885 submitted shows :

Gross earn.	Expenses.	Net earn.	Interest.	Deficit.
$1,916,964	$1,399,672	$517,292	$602,416	$85,124

Against this deficit there was a surplus of $88,713 left over from 1884. The mileage increased from 536 to 625 miles during the year.

Illinois Central.—On the extension of the Yazoo & Mississippi Valley Branch of the Southern Division, track is reported laid from Lexington, Miss., through Tchula to Sidon, a distance of 32 miles. Nearly all the grading and bridging on the extension is now completed, and tracklaying is progressing steadily.

This company has contracted to haul trains of the Cincinnati, Indianapolis, St. Louis & Chicago between Kankakee and Chicago at the same speed as it runs trains, and afford it the same facilities in Chicago for 99 years.

Illinois Midland.—In the United States Circuit Court in Springfield, Ill., June 10, Justice Harlan directed that a plea be entered in accordance with the mandate of the Supreme Court, fixing the date of the sale of the road for Sept. 30 next, and providing that if the road sells for less than $80,000, the sale in the discretion of the court may be set aside. This sum will be sufficient to pay the indebtedness proved against the company.

Kansas City, Memphis & Birmingham.—A correspondent writes as follows :

"All negotiations for the purchase of the Memphis, Birmingham & Atlantic road by the Kansas City, Memphis & Birmingham Co. are off. The latter will now build their entire line from Memphis to Birmingham. The line is

located for about 30 miles out of Birmingham, and for 20 miles out of Memphis. Work will be commenced on both ends and at several other points very soon. Two more parties of engineers will be put into the field in a few days. Capt. John A. Grant, Chief Engineer, hopes to have trains running from Memphis to Birmingham inside of two years."

Kansas, Nebraska & Dakota.—Track is reported laid on this road from Fort Scott, Kan., northward to Blue Mound, 20 miles. Grading is nearly finished from Blue Mound to Garnet, 18 miles, and is in progress from Garnet to Quenemo, 24 miles.

Louisville & Nashville.—The Louisville *Courier-Journal* of June 10 says: "The change of gauge on this system was commenced Friday, May 28, and completed Sunday, the 30th. Nothing, however, but the branch lines was commenced on the 28th. The main line, from Louisville and Henderson to New Orleans, and the Memphis line, were commenced at 4 a. m. of the 30th, and that afternoon testing engines were started from all terminal points on each division, to see that the work was safely and properly done. These testing engines carried competent officers, who inspected the track closely. Sunday night freight schedules were resumed on the different divisions that had freight to forward, passenger schedules were also resumed out of Louisville, Henderson, Birmingham, Montgomery, Flomaton, Pensacola, Mobile and New Orleans. The company had employed on the day of change of the main line and its important branches, May 30, an average of four men to each mile for the main line and siding, and five men for each mile of main track and siding in its terminal yards, making a total of 8,736 men employed in changing the tracks.

"The company also employed in its shops all its available men, including engineers, firemen, wipers, laborers, &c., working a force large enough to change the necessary engines and passenger equipment to start its passenger trains when the rails were changed. It is needless to say that such a feat has never before been accomplished or attempted. The Louisville & Nashville changed its whole line, consisting of the following mileage:

	Main line.	Side track.	Total.
Main Stem	185.23	53.14	243.37
Knoxville Branch	170.80	13.58	184.38
Nash. & Dec. Div.	119.09	13.33	132.42
South and North Alabama R. R.	182.58	33.51	216.09
Mob. & Mont. Ry.	178.80	19.26	198.06
N. O. & Mob. R. R.	141.00	22.30	163.30
Henderson Div.	151.45	16.24	167.69
Memphis Line	258.50	20.92	279.42
Pens. & At. R. R.	161.00	9.66	170.66
Pensacola Div.	44.54	6.70	51.24
Total	1,592.99	213.64	1,806.63

"It will be noted that the Louisville & Nashville changed 1,593 miles of main line and 213 miles of sidings on the 30th, and 312 miles branch lines and 16 miles of sidings on the two days previous to the 30th. In making its changes the company's officers were ably assisted by its employés in all departments.

"The general direction and supervision of the work of changing the gauge and of the special movement of the traffic immediately prior and subsequent to the change were in the hands of Mr. J. T. Harahan, General Manager, and he was specially assisted by Mr. Reuben Wells, Second Assistant to the President, to whom is due much of the credit for the admirable manner in which mechanical difficulties were overcome and the great work finished without hindrance or impediment.

"Messrs. R. Montfort, Resident Engineer, H. Middleton, Superintendent of Machinery, and George E. Evans, Superintendent of Transportation, were intrusted with important duties connected with their respective departments, and their efforts contributed in no small degree to the success of the undertaking.

"Mr. Harahan took up his position on the 30th at Nashville, where three divisions center, and personally directed operations from the point. Immediately after the track was changed he made an inspection of the various divisions of the system, and has returned to Louisville well satisfied with the result."

A very pleasant feature in connection with change was that the locomotive engineers, of their own motion, waived all claim to extra pay for extra hours of service required or extra time due to delays on the road during 10 days covering the time of change. The engineers and firemen not out on the road also offered their services gratuitously on the day of change to do such work as might be assigned them about the shops and yards. These offers were duly received and properly acknowledged by the officers of the company.

Louisville, New Albany & Chicago.—The company has under consideration the building of a branch line from Orleans, Ind., 56 miles north of Louisville, westward 17 miles to the West Baden Springs at French Lick, a watering place not now accessible by railroad.

Maine Central.—This company has finally decided to establish its new shops in Waterville, Me., the necessary land, 40 acres in all, having been purchased and deeded to the company. The new shops will be quite extensive and will cost about $200 000 in all, and it is expected that about 250 men will be employed in them when completed.

Minnesota & Northwestern.—Negotiations are reported to be in progress for the transfer of the controlling interest in this road to the Chicago, Rock Island & Pacific Co. On what basis the transfer is to be made is not stated, nor is it known that any agreement has been reached.

Missouri Pacific.—It will be remembered that at the annual meeting in March an increase of $6,000,000 in the capital stock was authorized, and $3,000,000 of the additional stock were then issued. The company has now issued a circular, in which it is announced that the remaining $3,000,000 are to be issued. This circular says: "To reimburse the company for the large expenditures made since January stockholders are now offered the right to subscribe for the remaining $3,000,000 (30,000 shares) of capital stock of the company at par, which will complete the increase of $6,000,000 (60,000 shares) in the capital stock originally contemplated. Stockholders will have the right to subscribe for 9 shares of new stock for every 100 shares now held by them. The transfer-books will close June 19, and the right to subscribe will expire on that day. Subscriptions will only be received for the issue of one share or some multiple thereof, and rights belonging to any number of shares may be assigned."

New York, Chicago & St. Louis.—The hearing in the foreclosure suit has been postponed until Sept. 14 next.

It is reported that negotiations are in progress for a settlement with the bondholders. The basis which common rumor has settled on is the issue of $25,000,000 in 4 per cent. bonds, with the Lake Shore guarantee, these bonds to be used to exchange for the first mortgage bonds at par and accrued interest and second mortgage bonds and the car trusts. Nothing definite can, however, be ascertained in regard to the present condition of these negotiations.

New York & New England.—The Massachusetts House last Tuesday substituted for the committee report on Mr. C. W. Field's complaint against the government, concerning the sale of state lands, a resolution giving the petitioner leave to withdraw, which is equivalent to ignoring the complaint.

New York, West Shore & Buffalo.—The double track which is to connect this road from near its Weehawken terminus with the Pennsylvania tracks is nearly completed. It will enable it to run its trains into the Pennsylvania station at Jersey City, and those which run in summer to the Catskills and Saratoga will so run, as they did last year, making the transfer much more convenient for passengers coming from Philadelphia, Washington, etc.

Niagara Falls & Whirlpool.—The Buffalo *Express* of June 6 says: "For a good many years one scheme and another has been broached for making more accessible the wild and romantic passage of the Niagara between the upper whirlpool rapids and the end of the long and interesting gorge which terminates at Lewiston. A portion of this lower gorge was opened to the eye of the tourist when the New York Central built its line to Lewiston. The road-bed for some distance is a shelf cut in the face of the cliff, high above the water. But the glimpses from this line are at best distant and fleeting. When steps were first taken toward establishing a state reservation at Niagara, it was proposed to include the American side as far as the whirlpool. The project was abandoned on account of the cost of securing so much territory. When on a visit to Niagara with the Park Commissioners Gov. Hill expressed the opinion that it would be well could the reservation extend to and include the whirlpool. At this time the feasibility of constructing a good footpath along the base of the American cliff as far as the whirlpool was discussed. Thus it will be seen that the project of making the whirlpool and adjacent parts of the river accessible to the public is not wholly new or original with the promoters of the present enterprise.

"Mr. Benjamin Fenton and Mr. Ensign Bennett, of this city, are understood to be the originators of the scheme for building a narrow gauge railway along the water's edge, between the Falls and the whirlpool. The confidence and cash of a number of gentlemen were speedily enlisted, and on Jan. 7 last the Niagara Falls & Whirlpool Co. was incorporated. The capital stock of the company is $100,000, in shares of $100 each. The stock is all taken, and it is expected that construction will begin as soon as right of way is secured. This, it is hoped, will be effected within a few weeks at the furthest.

"The original plan was to build the road from a point as near the foot of the inclined railway as possible to a point just below the whirlpool, a distance of nearly 3 miles. But the road will not be allowed to build on the lands of the state reservation. It will therefore commence at the reservation boundary. Its station will be situated under the bank of Prospect Park, a short distance above the upper suspension bridge. The tourist will have to make a short walk from the foot of the inclined railway to the railroad. The track will skirt the base of the cliff, just high enough above high-water mark to be secure. The base of the cliff for a long distance down stream is covered by a slope of detritus, along which, it is said, a road-bed may be easily constructed. One truss bridge, and trestle bridges over five mill races are required. Further down stream, between the railroad bridges and the whirlpool, an open cut of perhaps 1,000 ft. will be made; and near the whirlpool a short trestle bridge is required. It is said the rock cutting will be no more difficult than was much similar work on the West Shore along the Hudson. There will be no tunnels, for the object is to build a road which will reveal the river at every point traversed. Débris and blasted rocks will remove themselves by tumbling into the river. Protecting walls will be built here and there. The cost of construction, aside from right of way, is estimated at $100,000. The gauge will be between 30 and 42 in.

"As usual in such cases, the land desired has suddenly become of great value to the owners, though it is stated to have been so little thought of heretofore that most of it was untaxed. The engineer's plans call for a width of two rods on the left, or river side, of the centre line and four rods on the right. The cars will probably be built with seats facing the river, since the scenery along the route is all on one side of the track. It is a picturesque ride from the Upper Suspension Bridge to the railway bridges; but from that point to the whirlpool the scenery is wild and romantic, and has thus far been accessible only at one or two points. The proposed terminus of the road is under the cliff which skirts the De Veaux College grounds, opposite the outlet of the whirlpool. The feasibility of extending the line down the river, perhaps to Lewiston, or even to the beautiful union of Niagara and Lake Ontario, is already considered, and the plan may some day be carried out. The motive power for the road will probably be electricity. The vast water power of the river will probably be utilized whatever form of motor is adopted. The Legislature has authorized the company to charge not over 10 cents a mile, or 50 cents a round trip."

A property owner on the route of this proposed railroad opposes the condemnation of her land for it on the ground that it is not a public but a private corporation, inasmuch as it cannot obtain any commercial traffic.

Northern Pacific.—The Senate, by a vote of 39 to 1, has passed a bill forfeiting all of the land granted to this company on lines and parts of lines not completed at the time of the passage of the bill. The uncompleted portions are 75 miles on the Cascade Division, now under construction, including the passage of the mountains, and the whole of the line from Wallula down the Columbia River, which the company did not intend to build, the route having been occupied by the Oregon Railway & Navigation Co.

Oregon Improvement Co.—The statement for April and the five months of the fiscal year from Dec. 31 to April 30 is as follows:

	April.		Five months.	
	1886.	1885.	1886.	1885.
Earnings	$198,241	$230,768	$974,770	$1,128,461
Expenses	169,587	185,608	842,441	929,421
Net earnings	$28,654	$45,160	$132,329	$199,040

For the five months the gross earnings decreased $153,691, or 13.6 per cent., and the expenses $86,980, or 9.4 per cent., leaving a decrease in net earnings of $66,711, or 33.5 per cent. The statement includes all the operations of the company.

Oregon Railway & Navigation Co.—This company has sold $500,000 of its new 5 per cent. bonds through Hallgarten & Co., of New York, at a little above the current market price.

Pennsylvania.—The company has completed its four track system from Philadelphia to Devon, 15 miles, in which distance there is not a single grade crossing. A further extension of five miles is to be made.

Pennsylvania, Poughkeepsie & New England.—The franchises of this company were sold at sheriff's sale in Easton, Pa., June 14, for $50. A survey had been made for a line from Harrisburg through Northampton Co., Pa., to the Delaware River, and for a branch 21 miles long to Reading.

Richmond & Danville.—It is rumored that this company is preparing to remove its general offices from Richmond to Washington, it having recently bought property there and in Alexandria.

Rochester, Hornellsville & Lackawanna.—This is the name of a company incorporated at Albany to build a railroad from some point on the Lackawanna & Pittsburgh to Hornellsville, N. Y. Capital, $300,000.

St. Charles, Elgin & Southern.—Engineers are surveying for a proposed line by this name between Elgin and St. Charles, Ill., along Fox River. It is supposed that it may be intended for a branch of the Minnesota & Northwestern, which is to cross Fox River at St. Charles.

St. Louis, Salem & Little Rock.—A decree of foreclosure was entered at St. Louis June 15, at the suit of the Union Trust Co., of New York, trustee for the bondholders. There are nine overdue coupons.

San Antonio & Aransas Pass.—Work is now being pushed on the branch from Beeville, Tex., to Corpus Christi. At the southern end track has been laid for 3 miles from Corpus Christi and the piles are being driven for the trestle work across the bay.

St. Paul, Minneapolis & Manitoba.—Tracklaying on the Turtle Mountain Extension began June 9 with a large force. The main line is to extend to Bottineau, on the west side of Turtle Mountain, 110 miles from Devil's Lake, and a branch is to be built from Church's Ferry north up the Big Coutee valley, to be completed this year to or near Cando, the county seat of Towner Co.

Savannah & Tybee.—The incorporators met on June 12, at Savannah, Ga. On June 14 all the capital stock was subscribed, and preparations were made for organizing the company, which expects to build 18 miles of road from Savannah to Tybee Island.

Securities on the New York Stock Exchange.—The Governing Committee of the New York Stock Exchange has placed the following securities on the list:

Chesapeake & Ohio, $607,350 new second preferred stock, issued for unpaid coupons.

Detroit, Bay City & Alpena, $1,245,000 first-mortgage 6 per cent. bonds, being $15,000 per mile on 83 miles of road.

Gulf, Colorado & Santa Fe, $420,000 additional first-mortgage bonds, issued at the rate of $12,000 per mile on new road, making the total issue $8,340,000.

Norfolk & Western, $200,000 additional improvement extension 6s, making total issue $2,700,000.

Utica & Black River, 22,230 shares of capital stock, with 6 per cent. dividends, guaranteed by the Rome, Watertown & Ogdensburg Co., lessee.

Shenango & Allegheny.—The United States Circuit Court in Pittsburgh, June 10, granted a petition of the First National Bank of Youngstown, O., and other floating debt creditors, to intervene in the foreclosure suit.

Sulphur Springs & Mt. Pleasant.—This company has been organized to build a railroad from Sulphur Springs, Tex., to a connection with the St. Louis, Arkansas & Texas road at Mt. Pleasant. Surveys for the line have already been made and work is to be begun shortly.

Toledo, St. Louis & Kansas City.—This company has been formed by the consolidation of the companies organized in Ohio, Indiana and Illinois by the bondholders who bought the Toledo, Cincinnati & St. Louis road at foreclosure sale. It is stated that the new company will begin the work of changing the road from 3 ft. to standard gauge as soon as the liquidation over the ownership of part of the road is settled.

This is the name of the company organized this week in Toledo to succeed to the property of the bankrupt Toledo, Cincinnati & St. Louis Company. It issues $5,085,000 of preferred 4 per cent. stock and $12,250,000 of common stock, the latter going for stock of the old company.

Wabash, St. Louis & Pacific.—The *Commercial and Financial Chronicle* says: "The figures below have been furnished to the *Chronicle* as showing the actual results of the Wabash operations for the first four months of the current year as compared with the same months of 1885:

	April.		Four months.	
	1886.	1885.	1886.	1885.
Gross earnings	$1,028,339	$1,114,483	$3,919,982	$4,887,553
Oper. expenses	789,240	1,131,538	3,101,907	4,565 997
Net earnings	$239,099	Def. $17,055	$818,075	$321,556

"These earnings are based on the mileage actually operated each year, the number of miles being considerably less in 1886 than in 1885; but some of the leased lines that have been dropped were unprofitable and did not earn their expenses in 1885, and hence Wabash would have shown better *net* earnings in 1885 if it had operated only the smaller mileage of the present year. As to the gain in net earnings for four months, it is $496,000, being a trifle less than the $517,000 estimated by the committee; but as to the balance of this year their estimate of a gain of $350,000 net seems very moderate, though they explain this by saying that the company, during the last three months of 1885, which are the best months of the year, had the benefit of the higher rates for transportation, and therefore no large increase is to be looked for in the same months of this year."

The recent foreclosure sale was approved by the Court June 15, on condition that the balance of the $562,000 purchase money be paid by Aug. 1.

Wilkes-Barre & Philadelphia.—A new line is to be completed between these places by using parts of the Pennsylvania's lines and the Lehigh Valley and constructing some connecting lines, which is to be worked jointly by the Pennsylvania and the Lehigh Valley. Beginning at Wilkes-Barre, the North & West Branch of the Philadelphia & Erie will be followed southwest to Nescopec, 27 miles; thence the Pennsylvania will build a new railroad, the charter for which was obtained last week, south 12 miles to Rock Glen, on another branch of the Philadelphia & Erie, which will be followed six miles east from Rock Glen to Tomhicken. Thence a branch of the Lehigh Valley will be followed eastward 9 miles to Hazleton, whence the Lehigh Valley is to build a line about 12 miles long southward to the Mahanoy branch at Delano, whence for six miles that branch will be used to New Boston, and thence by the existing road and the Pennsylvania's Schuylkill Division to Philadelphia. It was originally expected that the Pennsylvania would build a wholly new line from New Boston to Hazleton and thence to Tomhicken, but by using parts of the Lehigh Valley, most of this work is saved. The new route will shorten by 50 miles the distance from the Pennsylvania's mines at Nescopec to Philadelphia. Work is begun on both sections of new road.

Williamsport & Northeastern.—Renewed efforts are making to secure the early construction of this proposed railroad from Williamsport, Pa., through Berenice and Little Meadows, Pa., to Union, N. Y., about 100 miles. The New York end is in charge of a company called the Binghamton & Southwestern. The cost is estimated at $4,000,000, and it is expected to raise $1,200,000 of it along the line.